

# Child Injury Deaths in Utah, 2005-2007



# Acknowledgments

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# Child Injury Deaths in Utah, 2005-2007



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January 18, 2011

Dear Reader:

The untimely death of a child is a tragedy for families and communities. Even more unsettling is when the death could have been prevented. From 2005-2007, 1,377 children 18 years of age and younger died in Utah. Of those deaths, just over one-third was caused by an injury.

The good news is many injuries are preventable. The Utah Department of Health Violence and Injury Prevention Program (VIPP) has a proud tradition of protecting the well-being of children in our state through surveillance, education, policy development, and community-based interventions. As part of the VIPPs efforts to reduce the occurrence of injuries among Utah's youngest citizens, it is my pleasure to present the *Child Fatalities in Utah, 2005-2007 Report*. Data for the report were collected through child death reviews.

This report provides extensive detail on the 14 most common injury-related deaths among Utah children. Recommendations for preventing these deaths are also given. The American Academy of Pediatrics recently issued a policy statement supporting federal and state legislation to enhance the child fatality review process. Utah is privileged to have a strong child fatality review system already in place.

It is my hope that this report will be used to better understand how and why child fatalities occur and to develop effective strategies for saving the lives of our precious children.

Sincerely,

W. David Patton  
Acting Executive Director



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# Executive Summary

# Executive Summary

The untimely death of a child is a tragedy for families and communities. Even more unsettling is when that death could have been prevented. From 2005-2007, 1,377 Utah residents 18 years of age and younger died. Of those deaths, 33.6% (N=463) were determined to be from injury<sup>1</sup>. Injuries are mostly preventable, yet they continue to be the leading cause of death for children 1-18 years of age in Utah.

Child death review teams are seen as a way to use a public health model of prevention through the review of child deaths. The American Academy of Pediatrics (AAP) recently issued a policy statement supporting federal and state legislation to enhance the child death review process. The AAP also recommended that pediatricians become involved in reviews in their local areas.<sup>2</sup>

This report summarizes child deaths in Utah from 2005-2007 and highlights injury deaths, both intentional and unintentional. Recommendations by the Child Fatality Review Committee on how to prevent these deaths are also included in the report. Key findings include:

## Homicides

- More than half of the child *homicides* resulted from injuries due to abuse.
- Characteristics of *abuse homicides* were:
  - The *perpetrator* is always the caregiver.
  - The weapon used to inflict the injury is the hands of the *perpetrator*.
  - Abuse injuries result in a less-immediate death.
- Abusive head trauma was the most common injury seen in deaths due to abuse.
- The Utah child *homicide* rate is significantly lower than the U.S. child *homicide* rate. However, for children under the age of two, there is no difference between the Utah *homicide* rate and the U.S. *homicide* rate.
- More than half of the child abuse death victims under age four had an existing illness or injury at the time of death.
- Males, specifically the biological father of the victim or boyfriend of the mother, were most often identified as the *perpetrators* in abuse homicides of children under age four.

## Suicides

- *Suicide* was the second leading cause of death for 16- and 17-year-olds for the years 2005-2007.
- The average age of *suicide* victims was 17.
- Males had a significantly higher rate of *suicide* than females.

## Drowning Deaths

- Nearly half of the child *drowning* deaths were witnessed by another person. The majority of these were witnessed by a peer.
- There are several age-distinct patterns among Utah *drowning* deaths. These include:
  - *Toddlers* wandering off and *drowning*;
  - Teens *drowning* in natural bodies of water;
  - Older children *drowning* in a swimming pool; and
  - *Infants* left unattended in bathtubs.

## Other Unintentional Injury Deaths

- *Drug overdose* was the most common cause of *other unintentional injury death*. Prescription medications were the most common drugs used.

## ATV Deaths

- White males living in *rural/frontier* counties made up the majority of all-terrain vehicle (*ATV*) deaths.
- The majority of the victims were driving the *ATV* at the time of the crash.

## Motor Vehicle Driver Deaths

- Utah teen drivers under age 19 had higher rates of *motor vehicle* crashes resulting in deaths than any other age group under the age of 65.
- Teens from *rural* and *frontier* areas had higher driver death rates than teens from *urban* areas.
- August was the month with the highest number of *motor vehicle* driver deaths, with the majority taking place on Friday, Saturday, and Sunday.
- Nearly half of the teen drivers who died were not wearing a *seat belt*.

## Motor Vehicle Passenger Deaths

- Children from *rural/frontier* areas had significantly higher rates of *passenger* deaths than children from *urban* areas.
- When a peer was the driver of the vehicle, his/her average age was 16.
- Nearly half of the decedents were not using a safety restraint.

## Motor Vehicle Pedestrian Deaths

- Most *motor vehicle pedestrian* deaths among younger children (ages 0-4) occurred in residential driveways.
- The majority of older children (ages 5-18) were hit while crossing a street.

## Infant Sleep Deaths

- Two of the most common factors associated with *infant* sleep-related deaths were:
  - The *infant* being put down to sleep on an adult bed; and
  - The practice of unsafe *co-sleeping*.

## Deaths from Sudden Infant Death Syndrome (SIDS)

- Male *infants* are at greater risk for *SIDS* than female *infants*.
- Nearly two-thirds of the *infants* who died of *SIDS* were sleeping in a bed type inconsistent with recommendations made by the American Academy of Pediatrics.
- *Infants* born to mothers who smoked were three times more likely to die from *SIDS* than *infants* born to mothers who did not smoke during pregnancy.

# Executive Summary

## SIDS vs. Asphyxia Deaths

- Hispanic *infants* had a significantly higher rate of death classified as *SIDS vs. Asphyxia*.
- Nearly 65% of *infants* whose deaths were classified as *SIDS vs. Asphyxia* had been sharing a sleep surface with another person.
- *Infants* born to mothers who smoked were nine times more likely to die from *SIDS vs. Asphyxia* than *infants* born to mothers who did not smoke during pregnancy.

## Unintentional Injuries During Sleep

- Unintentional suffocation while in a sleep environment was a leading cause of injury death for *infants* in Utah.

## Infant Sleep Deaths of Undetermined Manner

- Most of the *infants* who died from sleep deaths of undetermined manner had suspicious circumstances surrounding their deaths.

## Poisoning Deaths of Undetermined Manner

- White teenagers living along the Wasatch Front made up the majority of the *poisoning deaths* of an undetermined manner.
- *Opiates* were the most common drug found in *adolescents* who died of poisonings of an undetermined manner.
- Seventy-three percent of decedents had a known *substance abuse* problem, and 67% had a *history of treatment for mental illness*.

## Other Deaths of Undetermined Manner

- In the majority of other *deaths of undetermined manner*, no cause of death was evident.

## References

1 Injury-related deaths include the following: homicide, suicide, drowning, other unintentional injuries, ATV, motor vehicle (driver, passenger, and pedestrian), SIDS, SIDS vs. Asphyxia, unintentional injuries during sleep, infant sleep deaths of undetermined manner, poisonings of undetermined manner, and other deaths of undetermined manner.

2 Policy Statement Child Fatality Review. Christian CW, Sege RD. The Committee on Child Abuse and Neglect, The Committee on Injury, Violence and Poison Prevention, and The Council on Community Pediatrics. Pediatrics 2010;126:592-596; originally published online Aug 30, 2010; DOI 10.1542/peds.2010-2006.

# Child Death Review Process

# Child Death Review Process

## Child Fatality Review Committee

Each year about 450 children ages 0-18 die in Utah. In response to these deaths, an interagency Child Fatality Review Committee (CFRC) was established by the Utah Department of Health in 1992. The CFRC was charged with the review of the circumstances and cause of all childhood deaths in the state. The purpose of the CFRC is to develop a better understanding of child deaths in order to reduce the number of intentional and unintentional deaths of Utah children. Often, this involves improving the response of various agencies in the investigation of child deaths to prevent future deaths.

## Goals of the CFRC

- Identify and describe the prevalence of risk factors among deceased children by studying and reporting trends and patterns of child deaths in Utah.
- Maximize resources through interagency collaboration to identify and describe the service delivery of the involved systems (medical, human services, and law enforcement) to high-risk children, and make policy recommendations to improve the service systems to better meet the needs of all families involved with these systems.
- Promote effective prevention strategies to reduce the number of child deaths.
- Refer issues and propose strategies to appropriate organizations and agencies to promote education and prevention.

The CFRC meets once a month to review deaths of all Utah children (ages 0-18) who died within the three months prior, as well as any recent suspicious cases, and which were identified by the Office of the Medical Examiner (OME). These include *homicides*, *suicides*, suspicious or *undetermined deaths*, as well as any sudden and unexpected deaths. This death review process provides a detailed understanding of how and why child deaths occur in Utah. The goals of the reviews are to:

- Identify the important issues and concerns surrounding the deaths.
- Assess the accuracy and completeness of data from death investigations.
- Assess the accuracy and completeness of medical data surrounding the deaths.
- Improve communication through interagency collaboration of the various health, human services, and law enforcement agencies to ensure that complete and thorough investigations are performed on child deaths.
- Refer prevention and policy recommendations to the Child Fatality Advisory Committee.

The formation of the CFRC brings together diverse agencies and organizations that serve Utah children and families. This multidisciplinary approach enables members to share available information from different sources to better understand how and why a child has died. It is this coordination that improves the process of thoroughly reviewing child deaths in Utah.

## The CFRC includes representatives from the following agencies:

- Utah Department of Health
  - Violence and Injury Prevention Program (VIPP)

# Child Death Review Process

- Office of the Medical Examiner
- Bureau of Vital Records
- Emergency Medical Services
- Reproductive Health
- Department of Human Services (DHS)
  - Division of Mental Health
  - Division of Child and Family Services (DCFS)
  - Office of Service Review (DHS Fatality Review)
- Valley Mental Health
- Utah State Office of Education
- Salt Lake County District Attorney's Office
- Primary Children's Medical Center
- Utah Attorney General's Office, Children's Justice Division
- Utah Attorney General's Office, Child Protection Division
- Administrative Office of the Courts
- Juvenile Justice Services
- Various law enforcement agencies across the state

Periodically, other members are invited to attend reviews if they have expertise or history related to a particular case. These include representatives from support services, fire marshals, day care centers, child advocacy centers, etc. All information and data regarding each child death are treated confidentially. Committee members and professional visitors sign a confidentiality agreement which prohibits them from sharing case information outside the meeting. The review meetings are not open to the public.

## Review Process

The death of every child (ages 0-18) in Utah receives a review. Typically, deaths of a natural manner (i.e., deaths occurring shortly after birth or from disease or a medical condition) are not reviewed by the OME. Natural deaths involving birth defects are reviewed by the UDOH Birth Defects Network and natural deaths involving premature births are reviewed by the UDOH Perinatal Mortality Review Subcommittee. All other natural deaths receive a death certificate review.

## Death Certificate Review

Death certificates are reviewed by one of two CFRC medical consultants who are practicing pediatricians. Death certificates are reviewed to determine if: 1) the death needs an in-depth review by the full CFRC to address complicated issues surrounding the death or unusual circumstances; 2) the consultant can address any concerns directly to the parties who were involved during the child's treatment; or 3) the death does not need further review and can proceed to data entry. If the CFRC medical consultant finds it necessary to conduct an in-depth review, the death is scheduled to be reviewed at the next CFRC meeting.

## Medical Examiner Cases

Records for child decedents that are autopsied by the medical examiner are entered into the Medical Examiner System of Utah (MESU) in real time. From these records,

# Child Death Review Process

VIPP staff generate a weekly “MESU” report which is sent to the DHS Fatality Review Coordinator and the DCFS Consultant of CFRC for their review. The medical examiner assigned to the case may also send a Child Death Notice containing further details to the DCFS members of the committee and the VIPP.

## DCFS History

Upon receipt of the MESU report from the VIPP, the DCFS representative has the opportunity to research the DCFS history of each decedent and may recommend a further review by the CFRC.

## DHS Internal Review

In addition to the CFRC review, the Department of Human Services has a death review policy which requires a review of the deaths of all individuals for whom there is an open DHS case at the time of death, or in cases where the individuals or their families have received services through DHS within the 12 months preceding the death. Information obtained from case reviews provides insight into systemic strengths and highlights areas in where changes or modifications could enhance systemic response to client needs. MESU reports are sent to the DHS Office of Service Review Representative to expedite reviews at DHS.

## Child Death Review

CFRC members are notified of cases that will receive full review. The members bring information to the CFRC meetings, which helps the committee understand the circumstances surrounding the death, thus helping to resolve any questions pertaining to the particular case. During the review process, discussion topics include:

- Circumstances surrounding the death
- Preventability of the death
- Recommendations on improving service delivery systems for the prevention of future deaths

A case may need a follow-up review based on recommendations made during the meeting. For example, additional information may need to be gathered to answer questions that committee members may have. The case is resolved after the additional information has been obtained and the CFRC is satisfied that all questions and concerns have been addressed to the extent possible. These processes ensure that all child deaths in Utah receive an adequate review in order to reduce preventable child deaths.

# Findings and Recommendations



# Homicides



*A five-month-old boy was smothered with a pillow by his babysitter because he wouldn't stop crying. There were also signs the infant had been physically abused.*

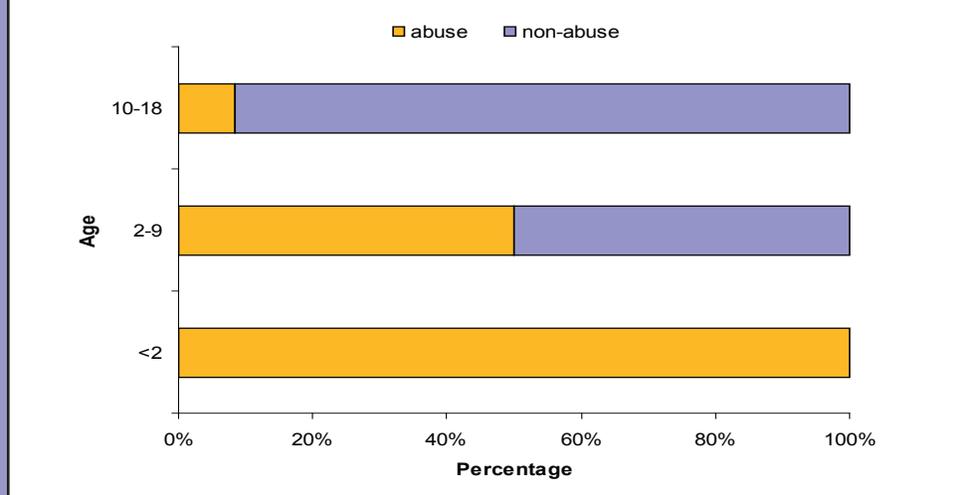
# 1. Homicides

## Key Findings

- More than half of the child *homicides* resulted from injuries due to abuse.
- Characteristics of *abuse homicides* were:
  - The *perpetrator* is always the caregiver.
  - The weapon used to inflict the injury is the hands of the *perpetrator*.
  - Abuse injuries result in a less-immediate death.
- Abusive head trauma was the most common injury seen in deaths due to abuse.
- The Utah child *homicide* rate is significantly lower than the U.S. child *homicide* rate. However, for children under the age of two, there is no difference between the Utah *homicide* rate and the U.S. *homicide* rate.
- More than half of the child abuse death victims under age four had an existing illness or injury at the time of death.
- Males, specifically the biological father of the victim or boyfriend of the mother, were most often identified as the *perpetrators* in abuse homicides of children under age four.

Of the 37 child *homicides* that took place from 2005-2007, 20 (54%) resulted from abuse injuries. Four characteristics separate *abuse homicides* from other child *homicides*. One characteristic across all cases is that a caregiver was the *perpetrator*. Additionally, an *infant* was often the victim. The average age of abuse decedents was 1.5 years. As age increases, the percentage of decedents who died as the result of abuse injuries decreases (Figure 1.A).

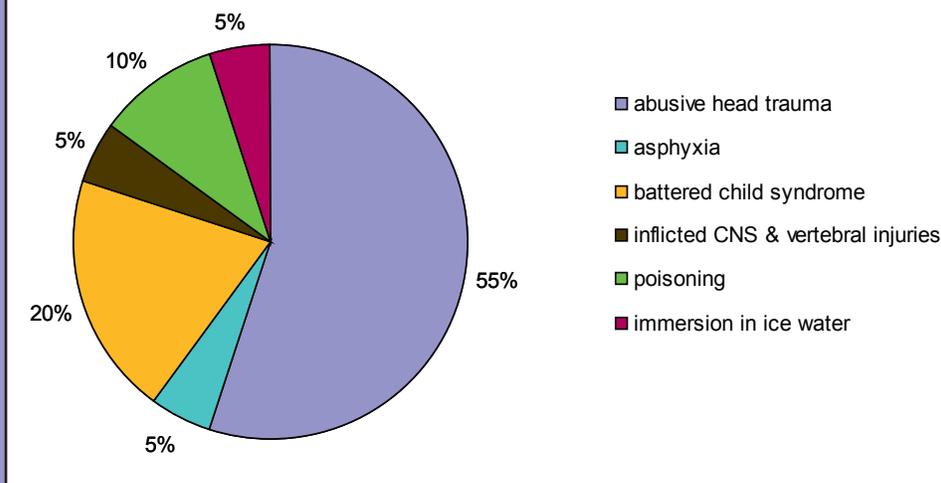
Figure 1.A: Abuse Homicides by Age Group, Utah Residents, 2005-2007, N=37



# 1. Homicides

The second characteristic is that the weapon involved was usually the hands of the *perpetrator*. All but three of the deaths that resulted from abuse injuries were due to assault by bodily force (e.g., hit, punch, slap, shake, etc.) (Figure 1.B).

Figure 1.B: Abuse Injury Homicides, Utah Residents, 2005-2007, N=20



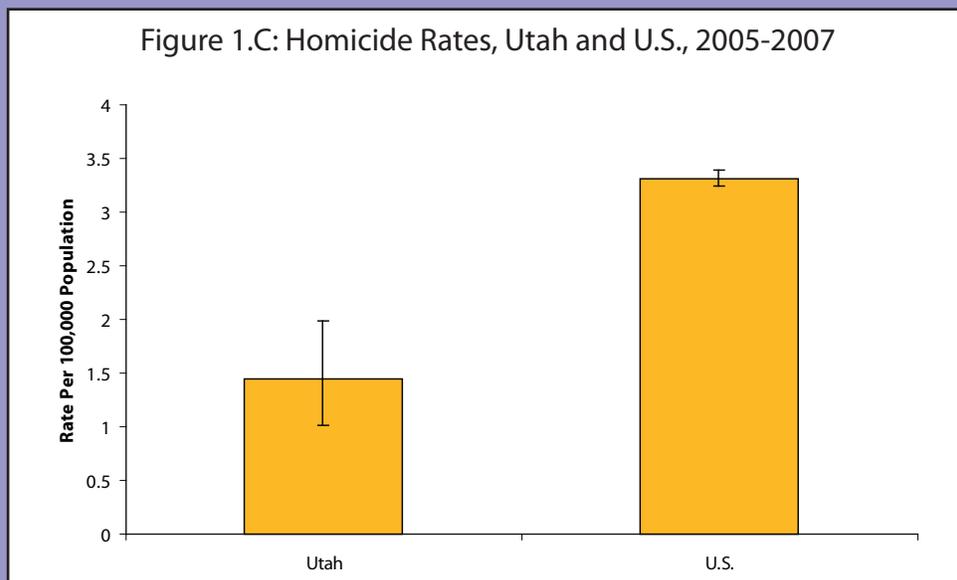
The third characteristic is that abuse injuries tended to result in a less immediate death than non-abuse injuries (e.g., *gunshot* wounds, setting on fire)—that is, there was less certainty while injuries were being inflicted that death would occur. Some abuse victims survived with brain damage well after having received their ultimately fatal injuries. Lastly, with *abuse homicides*, no *perpetrator suicides* occurred within 24 hours of the child abuse injuries that resulted in death.

In addition to these 20 abuse cases, an additional Utah child suffered assault by bodily force within the state but died just outside Utah. Because it was not immediately realized that the death took place out of state, the autopsy was conducted by the Utah Medical Examiner.

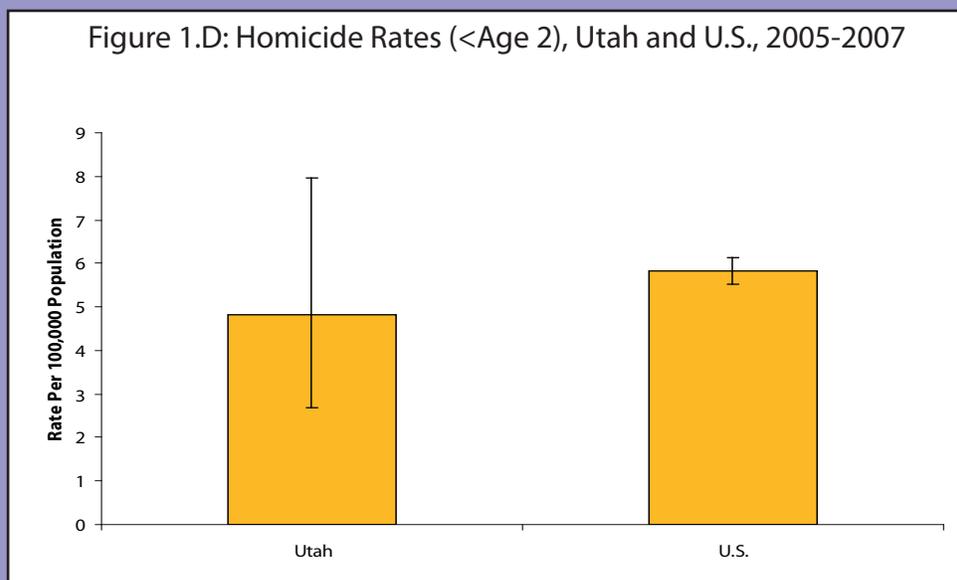
## Utah vs. U.S.

There is a statistically *significant difference* between Utah and U.S. child *homicide* rates. From 2005-2007, the U.S. rate was 3.3 per 100,000 population (N=7741), while the Utah *homicide* rate was 1.4 per 100,000 population (N=37) (Figure 1.C).

# 1. Homicides



While Utah has a lower child *homicide* rate than the U.S. overall, there is no *significant difference* between Utah and the U.S. for children under the age of two. The Utah 2005-2007 *homicide* rate for children under two years of age was 4.8 per 100,000 population (N=15) while the U.S. rate was 5.8 per 100,000 population (N=1452) for the same time period (Figure 1.D).

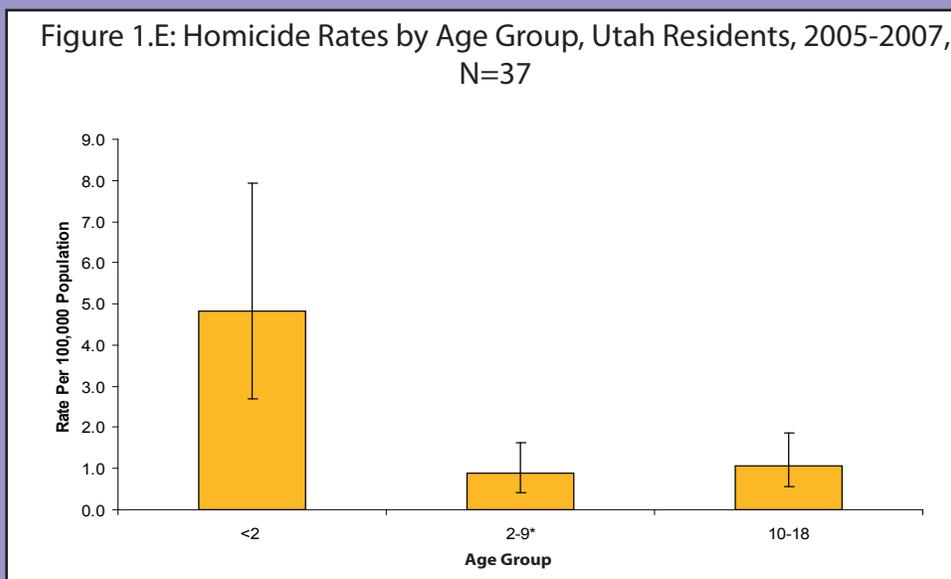


# 1. Homicides

## Age

The under-two age group had a significantly higher *homicide* rate than both the 2-9 and 10- to 18-year-old groups. The *homicide* rate for the under-two group was 4.8 per 100,000 population (n=15) while the *homicide* rates were 0.9 per 100,000 (n=10) and 1.1 per 100,000 (n=12) for 2- to 9-year-olds and 10- to 18-year-olds, respectively (Figure 1.E).

Figure 1.E: Homicide Rates by Age Group, Utah Residents, 2005-2007, N=37



\* Due to a small number of cases, findings for the 2-9 age group must be interpreted with caution.

## Sex

*Homicide* rates were the same for male and female child victims. From 2005-2007, the *homicide* rate was 1.4 per 100,000 population (N=19) for males and 1.4 per 100,000 population (N=18) for females.

## Race and Ethnicity

There was no significant *race/ethnicity* difference for child *homicides*. The *white non-Hispanic* death rate was 1.1 per 100,000 population (N=23) while the "other" death rate was 2.8 per 100,000 population (N=14).

## Urban, Rural, and Frontier Residence

There was no significant *urban*<sup>2</sup>, *rural*<sup>3</sup>, or *frontier*<sup>4</sup> difference<sup>5</sup> for *homicides* based on the county of residence. The *urban homicide* rate was 1.4 per 100,000 population (N=28) and the combined *rural/frontier homicide* rate was 1.5 per 100,000 population

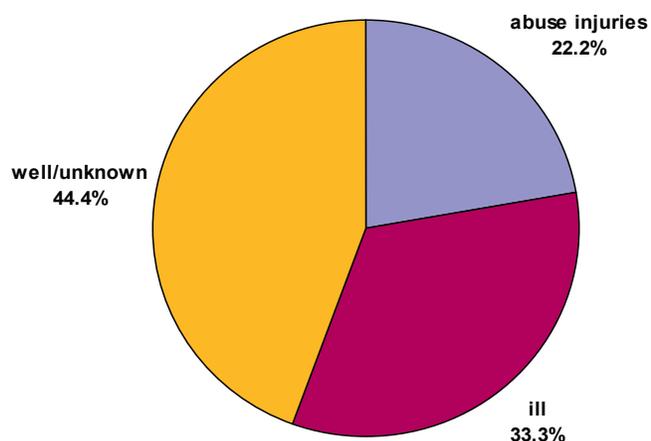
# 1. Homicides

(N=9). Likewise, there was no significant *urban-rural-frontier* difference for *homicides* that were the result of abuse injuries. The *urban abuse homicide* rate was 0.8 per 100,000 population (N=15) and the *rural/frontier abuse homicide* rate was 0.8<sup>1</sup> per 100,000 population (N=5).

## Illness or Injury and Abuse

Of the 18 children under age four who died due to abuse injuries, more than half (10) were known to have had an existing illness or injury at the time of death (Figure 1.F). Illnesses included otitis, bronchitis, influenza, congestion, gastrointestinal anomalies, chronic constipation, and bloody stool. Four had injuries of prior abuse (i.e., healing rib fractures, peritonitis).

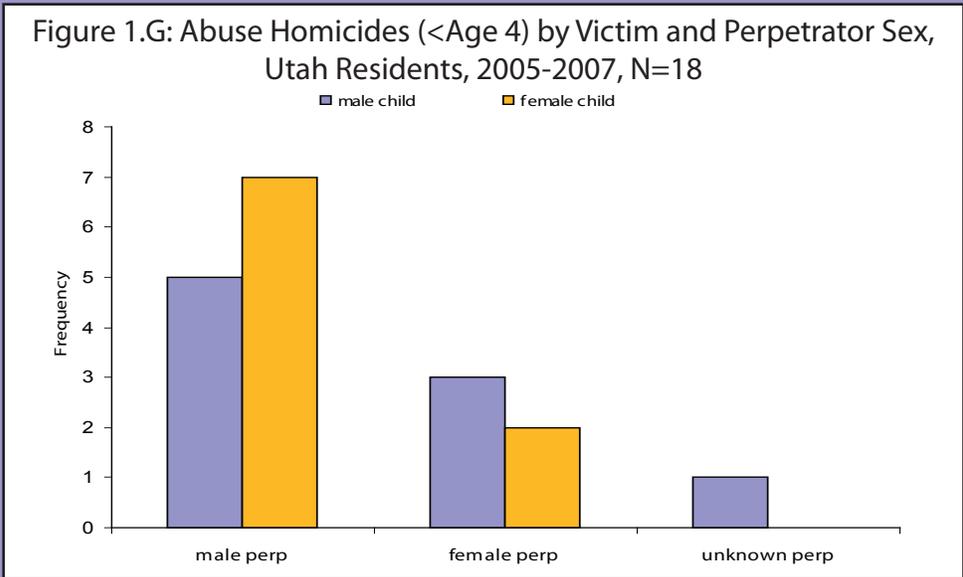
Figure 1.F: Abuse Homicide Decedents (<Age 4) by Health Status at Time of Fatal Injury, Utah Residents, 2005-2007, N=18



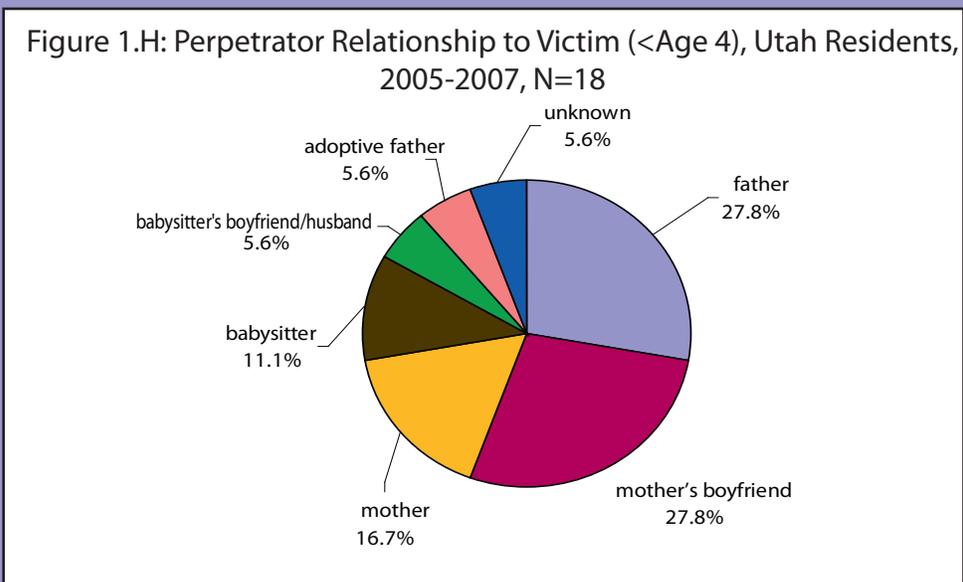
## Perpetrators of Abuse

For 17 children under age four who died as the result of abuse, the sex of the *perpetrator* is known. Victims were evenly split between males and females and there were more than twice as many male *perpetrators* as female *perpetrators* (Figure 1.G).

# 1. Homicides



Biological fathers and the mother's boyfriend were most frequently identified as *perpetrators* (each in 27.8 % of cases) and biological mothers were identified as the *perpetrator* in 16.7 % of the abuse cases (Figure 1.H). For victims of abuse under age four, male *perpetrators* ranged in age from 20-33, while female *perpetrators* ranged in age from 17- 43.



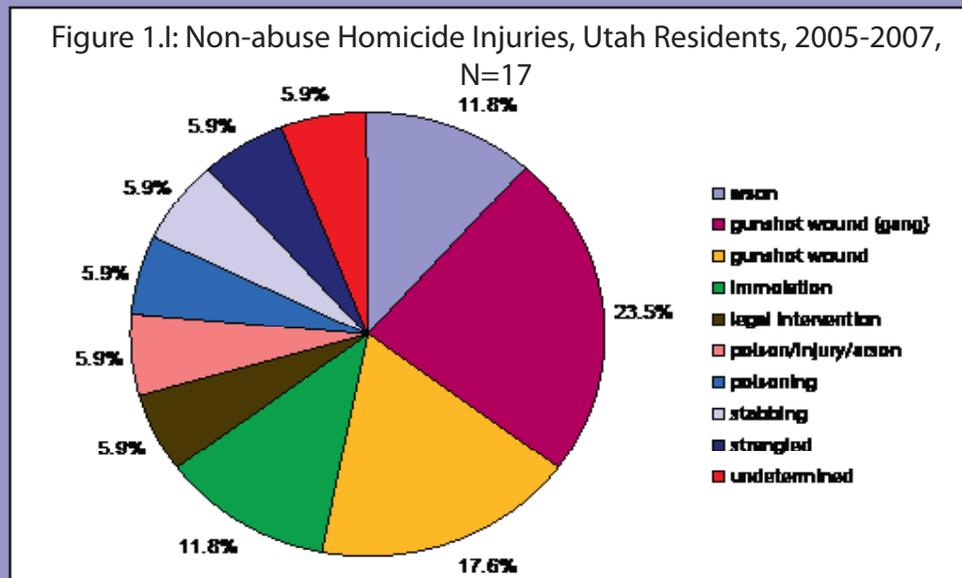
# 1. Homicides

## Non-abuse Homicides

Seven (41.2%) of the 17 non-abuse deaths took place as the result of *gunshot* wounds (Figure 1.I). Four of these shootings are believed to have been *gang-related*. All of these *homicides* involving guns are believed to have been perpetrated by males age 20 or younger. Additionally, one *homicide* was the result of *legal intervention*. Overall, gunshot wound victims ranged in age from 13-18.

Two separate incidents resulted in the deaths of five children who were killed by arson (*perpetrator* purposefully set fire to the home) or *immolation* (*perpetrator* purposefully killed the child by fire) (Figure 1.I). In both of these cases, the *perpetrator* (i.e., a parent) committed *suicide* during the same incident. The victims ranged in age from 3 to 9 years old. An additional child in this age range was kidnapped by a neighbor and murdered by undetermined means.

A stabbing, an administered *drug overdose*, and strangulation were the *causes of death* for three teens ages 15 to 18 (Figure 1.I). In two cases, the *perpetrators* were identified; they were 18 and 14 years of age at the time of the *homicides*.



# 1. Homicides

## References

1 The coefficient of variance = 0.447; therefore, this rate must be interpreted with caution.

2 *Urban* counties contain 100 or more persons per square mile. *Urban* counties include: Davis, Salt Lake, Utah, and Weber.

3 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.

4 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.

5 By location of residence.

# Recommendations

- To help prevent future child maltreatment deaths, educate the public to report any suspicions of abuse or neglect to Child Protective Services immediately.
- Increase education of parents on where to turn for help if they feel they are likely to harm their child.
- Increase education of health care providers and other professionals who work with families on where to refer families for help.
- Encourage parents to utilize licensed childcare providers.
- Increase education of males on how to handle a crying *infant*.
- Continue funding hospital education programs for parents on shaken baby syndrome.

# Suicides



*A 16-year-old boy with a history of depression and self-harm habits hanged himself in his room. He was being treated for depression at the time.*

## 2. Suicides

### Key Findings

- *Suicide* was the second leading cause of death for 16- and 17-year-olds for the years 2005-2007.
- The average age of *suicide* victims was 17.
- Males had a significantly higher rate of *suicide* than females.

Each year, roughly 15 percent of Utah high school students seriously consider attempting *suicide* and more than three percent make a *suicide attempt* that requires medical attention<sup>1</sup>. *Suicide* was the second leading cause of death after *motor vehicle* crashes for Utah 16- and 17-year-olds<sup>2</sup> for data years 2005-2007. The most frequent methods of youth *suicide* in Utah from 2005-2007 were hanging and use of firearms.

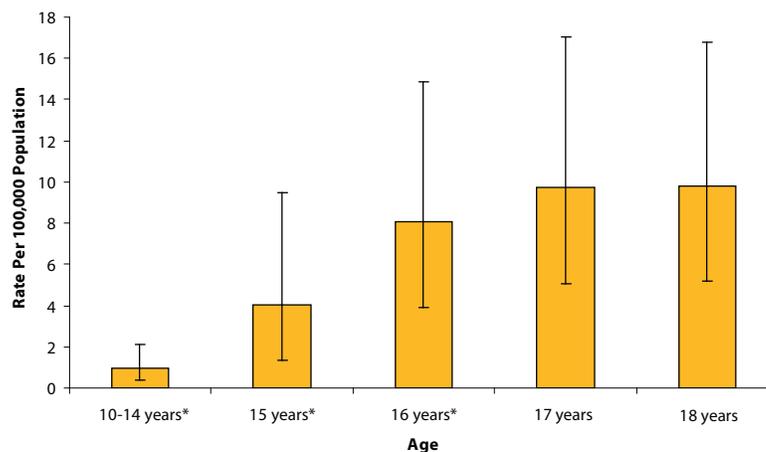
### Utah vs. U.S.

From 2005-2007, 46 Utah youth committed *suicide* for an overall rate of 4.1 deaths per 100,000 population<sup>4</sup>. Additionally, two out-of-state teens committed *suicide* while they were in Utah. There was no difference between the Utah and U.S. rates of youth *suicide* for the years 2005-2006<sup>3</sup>. The Utah rate was 3.9 per 100,000 population (N=29), while the U.S. rate was 3.6 per 100,000 population (N=2,699).

### Age

Decedents ranged in age from 10 to 18 years. The average age was 17. The rate among the 10- to 14-year-old age group (1.0 per 100,000 population, N= 6) was significantly lower than for 16-year-olds (8.1 per 100,000 population, N=10), 17-year-olds (9.8 per 100,000 population, n =12) and 18-year-olds (9.8 per 100,000 population, N=13) (Figure 2.A).

Figure 2.A: Suicide Rates by Age, Utah Residents, 2005-2007, N=46



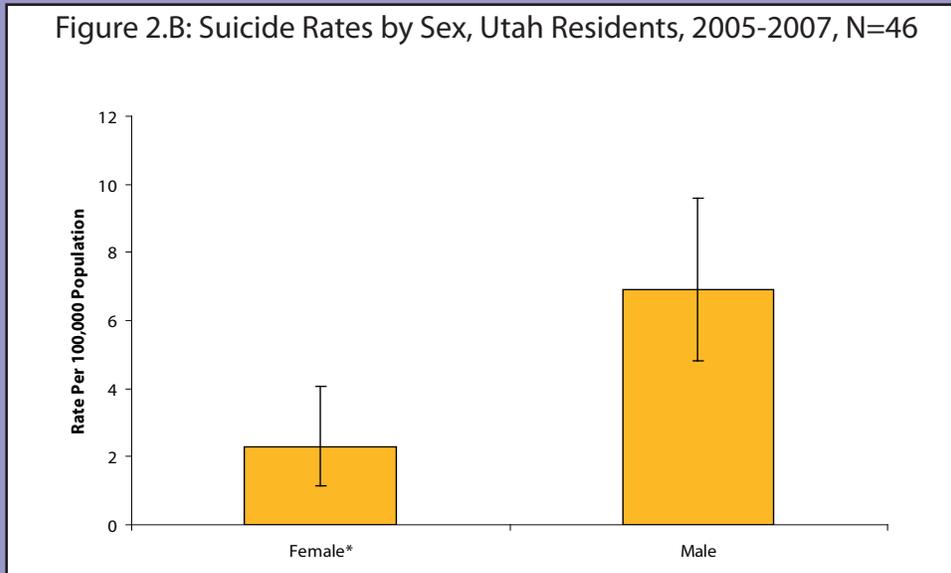
\*Due to a small number of cases, findings for these ages must be interpreted with caution.

## 2. Suicides

### Sex

Males had a significantly higher rate (6.9 per 100,000 population, N=35) of *suicide* than females (2.3 per 100,000 population, N=11) (Figure 2.B).

Figure 2.B: Suicide Rates by Sex, Utah Residents, 2005-2007, N=46



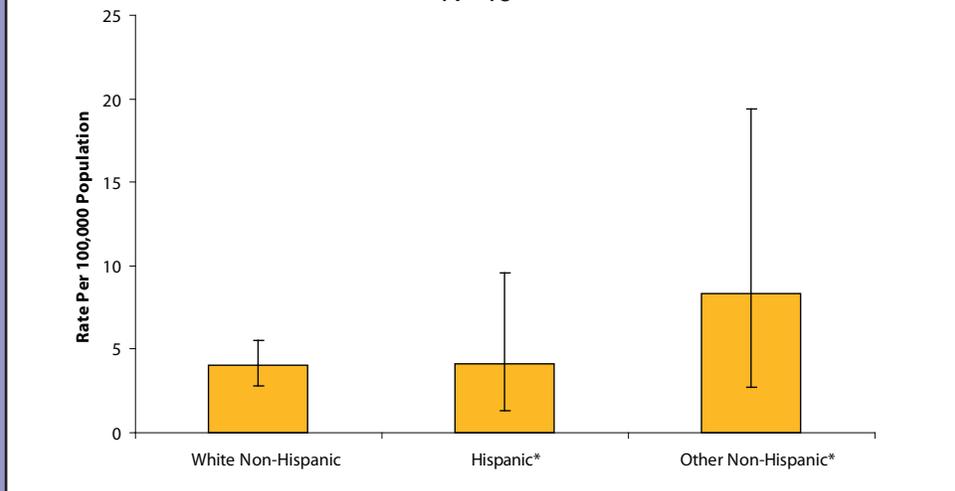
\*Due to a small number of cases, findings for these ages must be interpreted with caution.

### Race and Ethnicity

There was no statistically *significant difference* between *suicide* rates for *white non-Hispanic* (4.0 per 100,000 population, N=36), *Hispanic* (4.1 per 100,000 population, N=5) and *other non-Hispanic* (8.3 per 100,000 population, N=5). The youth *suicide* rate for *other non-Hispanic* youth was twice that of the other groups. This may be due to low numbers within Utah's minority populations. Should rates remain the same as these populations increase in numbers, statistically *significant differences* would be expected (Figure 2.C).

## 2. Suicides

Figure 2.C: Suicide Rates by Race/Ethnicity, Utah Residents, 2005-2007, N=46



\*Due to a small number of cases, findings for these categories must be interpreted with caution.

### Urban, Rural, and Frontier Residence

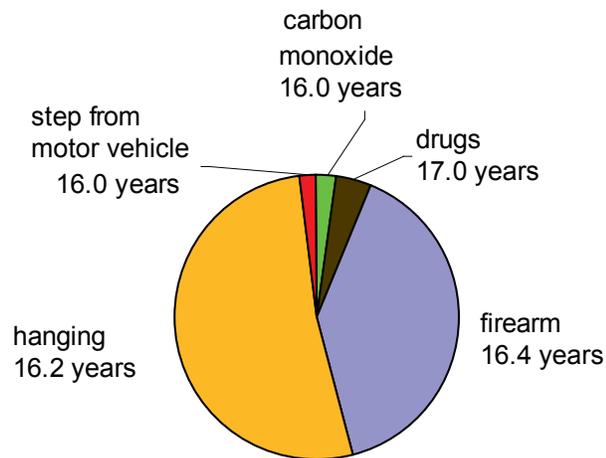
There was no significant *urban*<sup>5</sup>, *rural*<sup>6</sup>, or *frontier*<sup>7</sup> difference<sup>8</sup> for *suicides* based upon the county of residence. The *urban suicide* rate was 4.8 deaths per 100,000 population (N=36) and the *rural/frontier suicide* rate was 4.0 deaths per 100,000 population (n=10).

### Method

Youth *suicides* occur most often by hanging (52.1%) and firearm (39.6%). Three other methods were used among decedents from 2005-2007. There was little variation in average age by method, largely due to the fact that most *suicide* decedents were 16 to 18 years old (Figure 2.D).

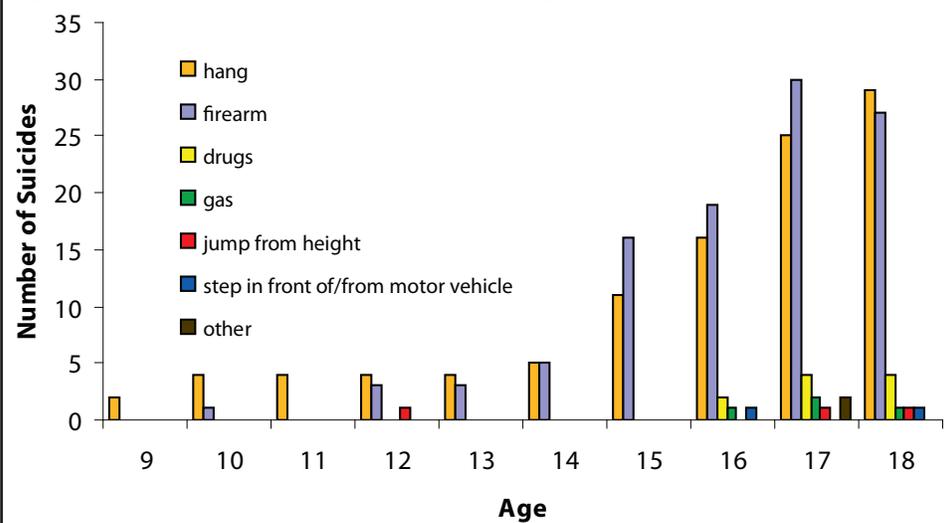
## 2. Suicides

Figure 2.D: Suicide Method and Average Age, Utah Residents and Non-residents, 2005-2007, N=48



Historically, *suicides* committed by younger decedents were by hanging. Use of firearms generally increases with age. Over the years, there are enough cases to determine statistically significant variation by age in method, with younger decedents opting for hanging and older teens using firearms (Figure 2.E).

Figure 2.E: Method of Youth Suicide by Age, Utah Residents, 1999-2009

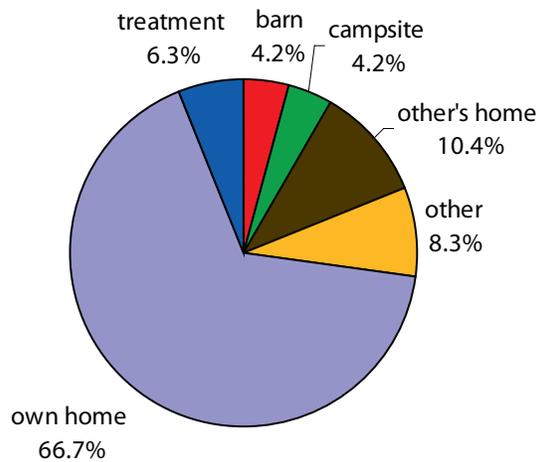


## 2. Suicides

### Incident Location

Thirty-two (66.7%) of the 48 *suicide* decedents fatally injured themselves while at their own residence. Due to the age of decedents, some may have been living on their own rather than in a parent's home. One decedent was homeless. Five decedents (10.4%) fatally injured themselves while at another's residence. Three decedents were in *residential treatment* when they fatally injured themselves (Figure 2.F).

Figure 2.F: Location of Suicide Incident, Utah Residents and Non-residents, 2005-2007, N=48

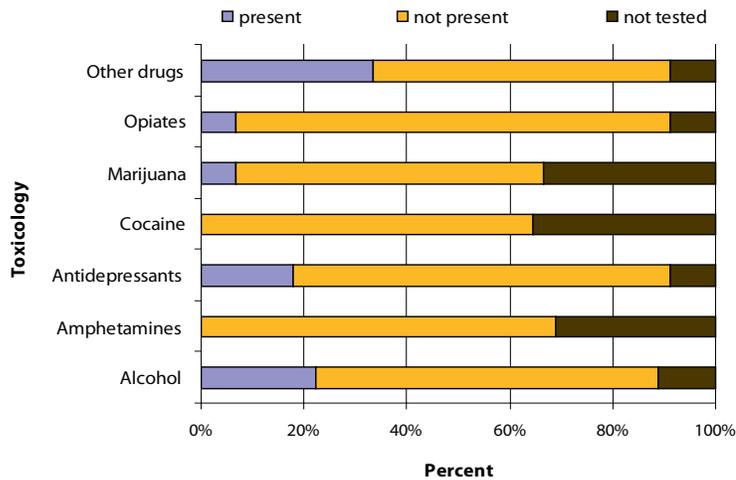


### Toxicology

Toxicology data were available for 45 *suicide* decedents. Of these, most (91.1%) were tested for antidepressants, *opiates*, and *other drugs* or alcohol (88.9%). About two-thirds of decedents were tested for *amphetamines* (68.9%), marijuana (66.7%), and cocaine (64.4%). Of those tested for alcohol, 25% had positive blood alcohol concentration levels. None of the *suicide* decedents tested positive for cocaine or for *amphetamines*. Likely drugs of abuse identified included *Xanax*, Valium, muscle relaxers, Benadryl, and *dextromethorphan* (Figure 2.G).

## 2. Suicides

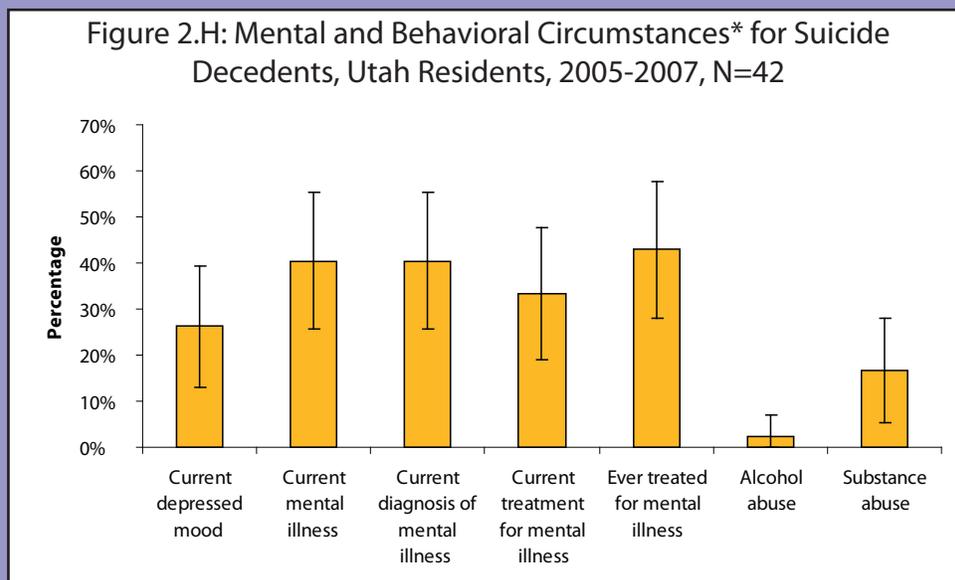
Figure 2.G: Toxicology Results for Suicide Decedents, Utah Residents, 2005-2007, N=45



### Mental and Behavioral Circumstances

Mental and behavioral circumstances were known for 42 of the youth *suicide* decedents. Overall, *history of treatment for mental illness* (42.9%), current mental illness (40.5%), and current diagnosis of mental illness (40.5%) were the most common circumstances identified. *Alcohol abuse*, identified for 2.4% of decedents, was significantly lower in occurrence than mental health circumstances (Figure 2.H).

## 2. Suicides



\*Note: Categories are not mutually exclusive.

### Precipitating Circumstances

Precipitating circumstances were known for 42 of the 46 Utah youth *suicide* decedents. Overall, “*crisis*” (defined as an event in the eyes of the decedent that happened within the two weeks before the death or was expected to happen within the upcoming two weeks), was the most frequently occurring circumstance—identified for 64.3% of decedents. Specific crises included: *other relationship problem* (not an intimate partner) (38.1%); *intimate partner problem* (35.7%); *school problem* (21.4%); and *recent criminal legal problem* (16.7%). There were no cases identified where other legal problems, *health problems*, or the recent death (non-suicide) of a family member or close friend was a precipitating circumstance.

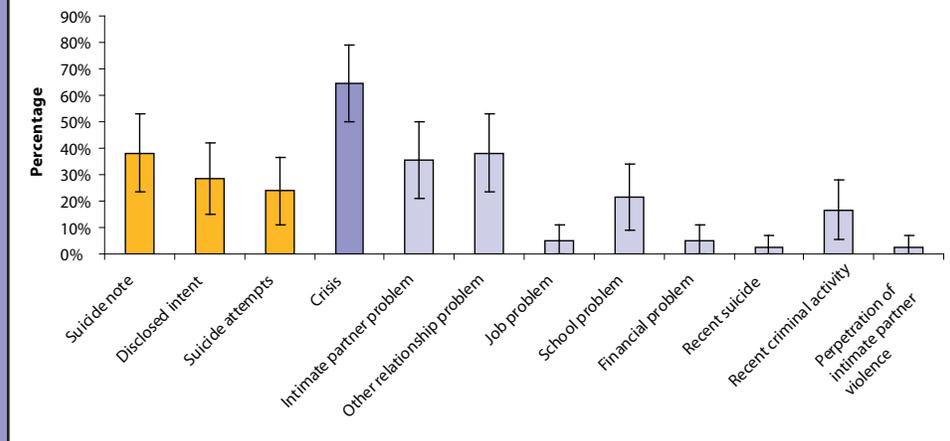
*Suicide notes* were left by 38.1% of decedents and 28.6% had previously disclosed their *suicidal intent*. Nearly one-fourth (23.8%) had made previous *suicide attempts* (Figure 2.I).

### Suicide Clusters and Patterns

Occasionally, multiple *suicides* of youth who lived in the same geographic area are seen in a relatively short time period. No such patterns were identified from 2005-2007.

## 2. Suicides

Figure 2.I: Precipitating Circumstances\* for Suicide Decedents, Utah Residents, 2005-2007, N=42



\*Note: Categories are not mutually exclusive. The light purple categories are a subset of a crisis (dark purple color).

### References

- 1 Youth Risk Behavior Survey, Utah data, years 2005, 2007, and 2009
- 2 For 18-year-olds, the second leading cause was non-MVC unintentional injuries; for 15-year-olds it was malignant neoplasm tied with non-MVC unintentional injuries; for 14-year-olds it was congenital conditions.
- 3 2006 is the most recent year for U.S. data.
- 4 Utah 2005-2007 population estimate of 10- to 18-year-olds, IBIS.
- 5 *Urban* counties contain 100 or more persons per square mile. *Urban* counties include: Davis, Salt Lake, Utah, and Weber.
- 6 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.
- 7 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.
- 8 By location of residence.

# Recommendations

- Increase the availability of adequate treatment programs for children diagnosed with mental disorders.
- Take any threat of *suicide* by a child seriously.
- Restrict access to highly fatal methods used for *suicide* by:
  - Keeping guns locked in a child-proof safe;
  - Installing safety locks on firearms; and
  - Properly disposing of unused prescription medications.
- Recognize that some children are at higher risk for *suicide*. These include children experiencing one or more of the following:
  - Mental disorders, particularly mood disorders, schizophrenia, anxiety disorders, and certain personality disorders;
  - Alcohol and other substance use disorders;
  - Hopelessness;
  - Impulsive and/or aggressive tendencies;
  - History of trauma or abuse;
  - Previous *suicide attempt*;
  - Family history of *suicide*;
  - Relational or social loss (e.g., break-up with boyfriend or girlfriend);
  - Lack of social support and sense of isolation; and
  - Exposure to, including through the media, and influence of others who have died by *suicide*.
- Proper treatment and support may reduce the likelihood that these children will attempt *suicide*.

(Source: Suicide Prevention Resource Center, Risk and Protective Factors for Suicide, <http://www.sprc.org/library/srisk.pdf>)

# Drowning Deaths



*A two-year-old girl was at a family gathering at a park. The park had a large pond next to the pavilion where the family was.*

*The girl wandered off and was missing for only five to 10 minutes before she was found by one of her siblings submerged in the pond.*

## 3. Drowning Deaths

### Key Findings

- Nearly half of the child *drowning* deaths were witnessed by another person. The majority of these were witnessed by a peer.
- There are several age-distinct patterns among Utah *drowning* deaths. These include:
  - *Toddlers* wandering off and *drowning*;
  - Teens *drowning* in natural bodies of water;
  - Older children *drowning* in a swimming pool; and
  - *Infants* left unattended in bathtubs.

*Drowning* is the process of experiencing respiratory impairment from submersion/immersion in liquid. *Drowning* outcomes are classified as death, morbidity, and no morbidity<sup>1</sup>. It is essential that uniform terminology be used in order that this public health problem is measured accurately. As of 2002, at the World Congress on Drowning, the decision was made to do away with terms such as near-drowning, dry drowning, wet drowning, active or passive drowning, secondary drowning, and silent drowning.

### Witnessed Drownings

Nearly half (N=16) of the 34 child *drowning* deaths that occurred in Utah between 2005-2007 were witnessed. From the witness data available (for 13 cases), it is known that just one incident was witnessed by an adult rather than by a peer<sup>2</sup>. Because *drowning* typically happens very quickly and quietly (usually there is very little splashing and the victim can't wave, yell, or call for help<sup>3</sup>), it may be that there was little opportunity for rescues to have taken place. Moreover, it is known that in at least three of these witnessed events, the witnesses themselves were too young to have helped the victims. Examples of witnessed *drownings* included:

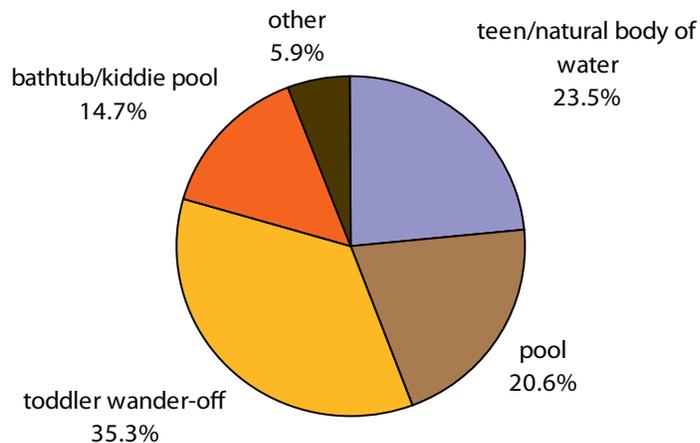
- 18-year-old male: Decedent said he was getting tired after swimming 40 yards. Another boy made it to shore and looked back and saw decedent going in the wrong direction. The victim started to tread water and then went under.
- 17-year-old male: Decedent and friends decided to swim out to a boat. They got tired and yelled for help. The friends in the boat thought they were playing around and didn't go back for them.
- 15-year old-male: Decedent saw something in the water and wanted to swim out to it. He yelled out that he was cold and couldn't swim anymore. Siblings jumped out to find him but could not.

### Location and Circumstances

There are several age-distinct patterns among the Utah child *drowning* deaths (Figure 3.A).

## 3. Drowning Deaths

Figure 3.A: Child Drowning Circumstances, Utah Residents, 2005-2007, N=34



The most common scenario involves *toddlers* wandering off and ending up in an outdoor water source. In some instances, the child was thought to be indoors, but had managed to get out of the house undetected. Several instances involved a caregiver engaged in another activity. Often, toddler (under age four) wander-off *drowning* deaths took place at multi-generational family gatherings where no one adult in particular was designated as the official child watcher.

There were several *drowning* deaths of older children (ages 5 -13) that all took place during parties at swimming pools where there was insufficient adult supervision. The decedents were frequently discovered by other children.

Another common scenario involves teens (frequently male) in natural bodies of water (usually reservoirs or lakes). These cases all involved groups of friends and it is suspected that peer pressure may have played a role in risk-taking behaviors that were a contributing factor in these deaths.

Lastly, several *infants* were left unattended in bathtubs and drowned.

### Utah vs. U.S.

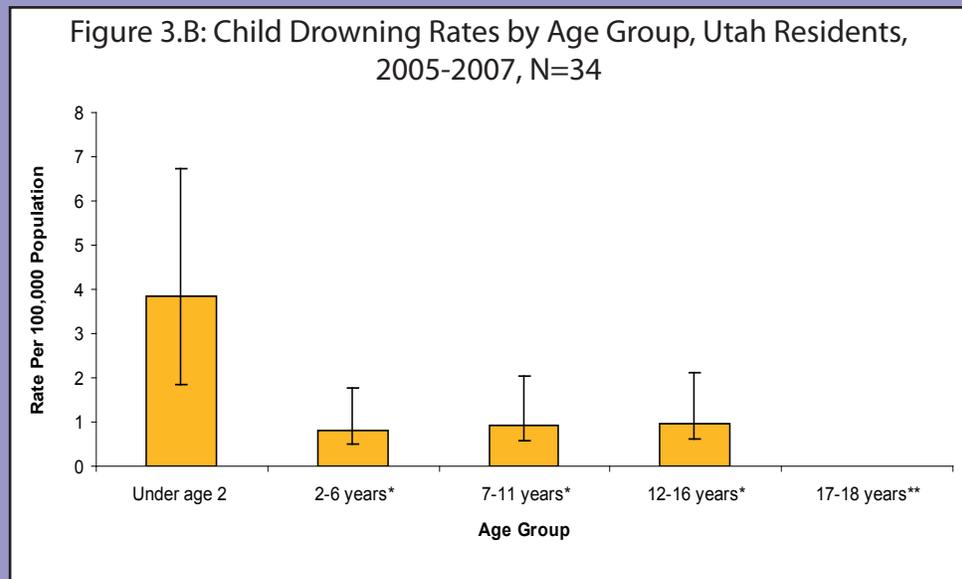
There is no *significant difference* between Utah and U.S. child *drowning* rates for 2005-2006<sup>4</sup>. The Utah rate is 1.4 per 100,000 population (N=24) and the U.S. rate is 1.4 per 100,000 population (N=2169).

### Age

The only statistically *significant difference* between age groups was found between children under age two and 2- to 6-year olds. The 2- to 6-year-old age group had the

## 3. Drowning Deaths

lowest rate at 0.8 per 100,000 population (N= 6) while the under-2 age group had the highest rate at 3.9 per 100,000 population (N=12) (Figure 3.B).



\*Due to a small number of cases, findings for these age categories must be interpreted with caution. \*\*The 17-18 age group contained too few cases to be reliable and was therefore excluded.

### Sex

There was no statistically *significant difference* between males and females among children and teens who died from *drowning*. From 2005-2007, the *drowning* death rate was 1.7 per 100,000 population (N=22) for males and 1.0 per 100,000 population (N=12) for females.

### Race and Ethnicity

There was no statistically significant *race/ethnicity* difference for *drowning* deaths. The *white non-Hispanic* death rate was 1.3 per 100,000 population (N=27) while the “other” death rate was 1.4 per 100,000 population (N=7).

### Urban, Rural, and Frontier Residence

There was no statistically significant *urban*<sup>5</sup>, *rural*<sup>6</sup>, or *frontier*<sup>7</sup> difference<sup>8</sup> for *drowning* deaths based upon the county of residence. The *urban drowning* death rate was 1.2 per 100,000 population (N=24) and the *rural/frontier* death rate was 1.6 per 100,000 population (N=10).

## 3. Drowning Deaths

### References

1 WHO; Department of Injuries and Violence Prevention

2 Four cases involved a witness who may have been over age 18 but was a friend/peer of the decedent.

3 Pia, Frank; "The RID Factor as a Cause of Drowning"; Parks and Recreation, v19 n6 p53-57, 67 Jun 1984

4 2006 is the most recent year for U.S. data.

5 *Urban* counties contain 100 or more persons per square mile. *Urban* counties include: Davis, Salt Lake, Utah, and Weber.

6 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.

7 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.

8 By location of residence.

# Recommendations

- Continue to support Primary Children's Medical Center's "Danger at Any Depth" *drowning* prevention campaign.
- Prepare media messages to respond to *drowning* or near-drowning incidents.
- Increase education and public awareness on *drowning* prevention to encompass the following:
  - Children should always have close supervision around any water, regardless of the depth. Assign a responsible adult to provide constant supervision at parties and family gatherings that take place near water. Consider having a water-watcher vest for adults who are providing supervision.
  - Children should never be left alone in or around water, even for a short amount of time.
  - Everyone should wear a life jacket while on a boat or during water sports. Children should also wear a life jacket when near open bodies of water such as lakes, rivers, streams, ponds, etc.
  - Children should be taught to swim. The American Academy of Pediatrics does not recommend swimming lessons as the primary means of *drowning* prevention for children younger than age four. Constant supervision is necessary even when children have completed swimming lessons.
  - Children should be taught to never dive into any water before it is inspected for safety.
  - Carbon monoxide detectors should be installed on all houseboats.
  - Children should never be allowed to swim by a boat when it is running, even if the propeller isn't engaged.
  - Pools and hot tubs should be enclosed with self-closing and self-locking gates.
  - Always empty wading pools, water buckets, etc. after use.
  - Learn cardiopulmonary resuscitation (CPR).
- Increase education of teens on the dangers of *drowning*, especially in regard to swimming in open bodies of water and overestimating how well they swim.
- Increase education of children on the dangers associated with holding their breath under water.

## Other Unintentional Injury Deaths



*A 16-year-old boy took prescription drugs with a friend to get high. He died later that evening from an unintentional overdose.*

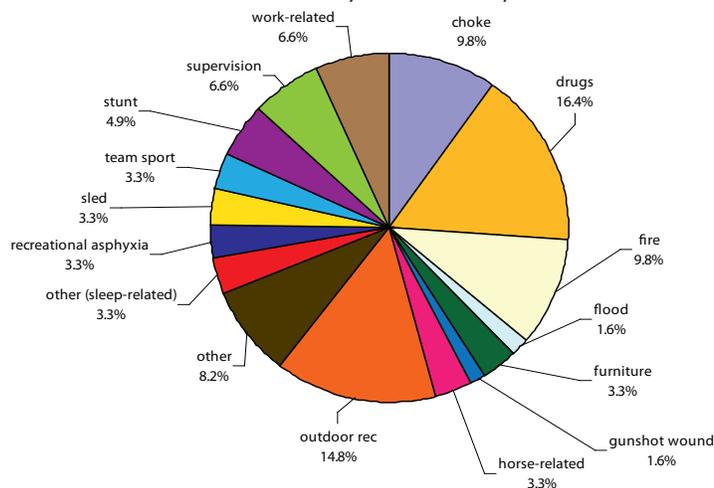
## 4. Other Unintentional Injury Deaths

### Key Findings

- *Drug overdose* was the most common cause of unintentional injury death. Prescription medications were the most common drugs used.

This section provides an overview of non-*motor vehicle* unintentional injuries and excludes *ATV* deaths, *drowning* deaths, and unintentional injury deaths of *infants* that took place in a sleep environment. Between 2005-2007, a total of 61 children aged 18 and younger died as the result of these other<sup>1</sup> unintentional injuries in Utah. Fifty-seven of these deaths were Utah residents. The most common causes of these deaths were *drug overdoses* (10), injuries that took place during non-motorized outdoor recreational activities (9), residential fires (6), and choking (6) (Figure 4.A).

Figure 4.A: Other Unintentional Injury Deaths, Utah Residents and Non-residents, 2005-2007, N=61



### Drug Deaths

Nine of the 10 decedents who died of *drug overdose* were between the ages of 12 and 18. These nine cases all involved the decedent using drugs recreationally. Six cases (60.0%) involved prescription drugs (mostly *opiates*), three involved illicit drugs, and one case was alcohol poisoning. The average age of the decedents was 16.1 years. Decedents were predominately male. All decedents were Utah residents. Too few cases exist to present any meaningful analysis of accidental drug (or, even more generally, poison) deaths over time.

## 4. Other Unintentional Injury Deaths

### Outdoor Recreation Deaths (excluding drowning and ATVs)

All nine outdoor recreation deaths took place while the decedent was involved in some type of non-motorized outdoor recreational activity. Ages ranged from 10-18 and the average age was 14.2 years. Decedents were predominately male. Two out-of-state decedents died from hyperthermia, while the Utah residents died from other causes. Beyond the child death data maintained by the Utah Department of Health Violence and Injury Prevention Program (VIPP), coding does not exist to readily identify cases as recreational deaths. Too few cases exist to present any meaningful longitudinal analysis of outdoor recreation deaths.

### Residential Fire Deaths

Between 2005-2007, six children lost their lives in fires. Ages ranged from 1-12 years, and the average age was 3.7 years. Males and females were of equal number and all decedents were Utah residents. Too few cases exist to present any meaningful longitudinal analysis of unintentional fire deaths.

### Choking Deaths

Six children between the ages of 1 and 8 died as the result of choking. It is noted that the oldest decedent had *disabilities*. The average age of decedents without *disabilities* was 1.3 years. Foods involved included bacon, a peanut, a lollipop, and pizza. Too few cases exist to present any meaningful longitudinal analysis of accidental choking deaths.

### "Supervision" Deaths

"Supervision" deaths all took place in homes and could likely have been prevented with either closer supervision of the child or modification of the environment in order to accommodate a young child. All four of the "supervision" deaths were among *toddlers*. Beyond the child death data maintained by the VIPP, coding does not exist to readily identify cases as "supervision" deaths. Too few cases exist to present any meaningful longitudinal analysis of "supervision" deaths.

### "Stunt" Deaths

"Stunt" deaths were among 14- to 15-year-old males who engaged in risky activities. There was no indication that alcohol or any other intoxicants were involved. Beyond the child death data maintained by the VIPP, coding does not exist to readily identify cases as "stunt" deaths. Too few cases exist to present any meaningful longitudinal analysis of "stunt" deaths.

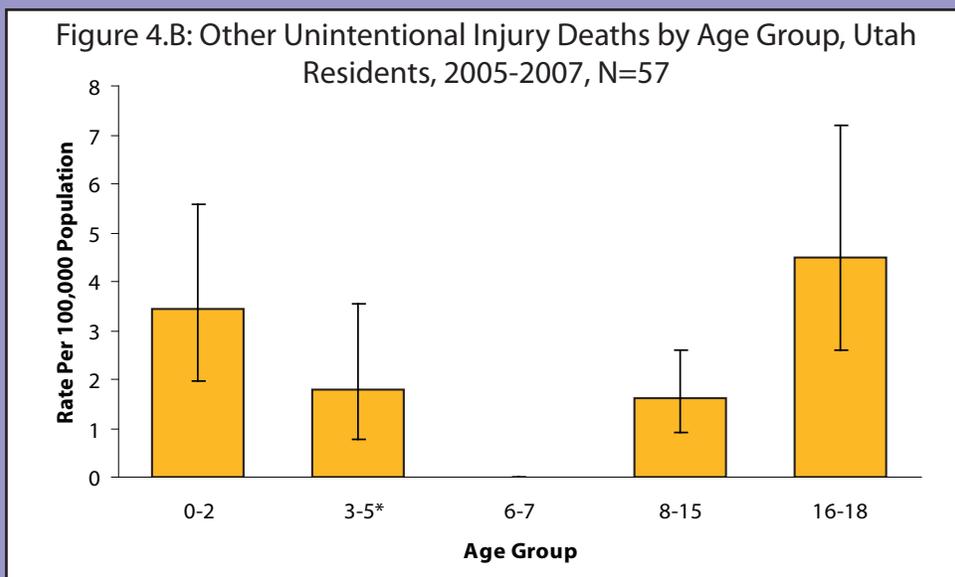
### Furniture Deaths

Furniture deaths involved *toddlers* pulling heavy pieces of furniture onto themselves. Beyond the child death data maintained by the VIPP, coding does not exist to readily identify cases as the child pulling a piece of furniture onto him/herself. Too few cases exist to present any meaningful longitudinal analysis.

## 4. Other Unintentional Injury Deaths

### Age

The only statistically *significant difference* between age groups for other unintentional injury deaths was between the 8- to 15-year-olds and the 16- to 18-year-olds. There were no other unintentional injury deaths of children ages 6-7. The 8- to 15-year-old age group had the lowest rate at 1.6 per 100,000 population while the 16- to 18-year-old age group had the highest at 4.7 per 100,000 population (Figure 4.B).



\* Due to a small number of cases, findings for the 3-5 age group must be interpreted with caution.

### Sex

There was no statistically significant difference between males (3.0 per 100,000 population, N=40) and females (1.4 per 100,000 population, N=17) who died of other unintentional injury deaths.

### Race and Ethnicity

There was no statistically significant difference between *white non-Hispanic* decedents and decedents of "other" races/ethnicities. The death rate for *white non-Hispanic* decedents was 2.2 per 100,000 population (N=45) while the death rate for "other" decedents was 2.1 per 100,000 population (N= 9). Note that race was not reported for all Utah decedents.

## 4. Other Unintentional Injury Deaths

### Urban, Rural, and Frontier Residence

There was no statistically significant *urban*<sup>2</sup>, *rural*<sup>3</sup>, or *frontier*<sup>4</sup> difference<sup>5</sup> in other unintentional injury death rates based upon the decedent's county of residence. The *urban* resident death rate was 1.8 per 100,000 population (N=35) while the *rural/frontier* resident death rate was 3.6 per 100,000 population (N=22).

## 4. Other Unintentional Injury Deaths

### References

1 "Other" refers to deaths excluding *drownings* and accidental *infant* deaths that took place in a sleep environment.

2 *Urban* counties contain 100 or more persons per square mile. *Urban* counties include: Davis, Salt Lake, Utah, and Weber.

3 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.

4 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.

5 By location of residence.

# Recommendations

- Increase funding for culturally appropriate injury prevention programs that target injuries among children to include:
  - Fire deaths
  - Fall deaths
  - Danger of *toddlers* pulling heavy objects down on themselves
  - “Stunt” deaths
  - Choking deaths
  - Outdoor recreation deaths
  - Drug and *poisoning deaths*



# ATV Deaths



*A 14-year-old boy was driving an ATV without a helmet or any type of protective equipment. He crashed the vehicle, which then rolled, and suffered a fatal head injury.*

## 5. ATV Deaths

### Key Findings

- White males living in *rural/frontier* counties made up the majority of all-terrain vehicle (*ATV*) deaths.
- The majority of the victims were driving the *ATV* at the time of the crash.

For purposes of reporting, this category is made up of cases that are classified under the *ICD-10* code system<sup>1</sup> as “V86” (decedents who were an occupant of special all-terrain or other *motor vehicle* designed primarily for off-road use injured in a transport accident, but not in a vehicle in stationary use or maintenance). *ATVs* include: “four-wheelers,” snowmobiles, dune buggies, and motorized go-carts.

From 2005-2007 there were 12 *ATV* deaths among Utah residents ages 5-18 years, for a death rate of 0.7 per 100,000 population<sup>2</sup>. There were no *ATV* deaths of children or *infants* under age five during this same period. In addition to these 12 deaths, one child from outside the state died from an *ATV* injury sustained in Utah.

### Age\*

Decedents (including the one out-of-state resident) ranged in age from 5 to 18. The average age was 12.1 years.

### Sex\*

More than two-thirds of the 13 *ATV* decedents were male.

### Race and Ethnicity\*

More than two-thirds of the 13 *ATV* decedents were *white non-Hispanic*<sup>3</sup>.

### Urban, Rural, and Frontier Residence\*

More than half of the *ATV* decedents were residents<sup>4</sup> of Utah *rural*<sup>5</sup> or *frontier*<sup>6</sup> counties.

### Driver vs. Passenger<sup>7\*</sup>

More than half of the 13 *ATV* decedents were drivers. Drivers ranged in age from 6 to 18 with an average age of 14.2 years.

\*Because of the small number of *ATV* deaths, a more precise breakdown for this variable cannot be provided.

## 5. ATV Deaths

### References

1 ICD stands for the International Classification of Diseases. It is a coding system maintained by the World Health Organization and the U.S. National Center for Health Statistics used to classify *causes of death*, injury, and disease. These codes are updated approximately every 10 years to account for advances in medical technology. The U.S. is currently using the 10th revision (*ICD-10*) to code *causes of death*.

2 Rate based on decedents ages 5-18 and for the 5- to18-year-old population.

3 Person who is not Hispanic and has origins among any of the original peoples of Europe, North Africa, or the Middle East.

4 By location of residence.

5 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.

6 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.

7 Person not operating vehicle, yet being transported by the vehicle. Includes exterior riders not using designed seating.

# Recommendations

- Increase education of children and their parents about *ATV* helmet laws in Utah.
- Collaborate with law enforcement and Utah State Parks to develop culturally appropriate public service announcements and public information messages to educate parents regarding the dangers associated with children riding or driving *ATVs*.
- Target education about *ATV* laws to the following:
  - Department of Natural Resources
  - Division of Motor Vehicles
  - Utah campgrounds
  - United States Forest Service
  - Faith-based groups
  - Scouting groups
  - Recreational vehicle businesses
  - Wildfire prevention programs
  - Insurance companies
- Increase the availability and publicity of Utah off-highway vehicle operator classes.
- Increase data collection on helmet use among *ATV* riders.
- Pass legislation to require off-highway vehicle classes for all ages.

# Motor Vehicle Driver Deaths



*An 18-year-old girl from rural Utah was driving recklessly and lost control of her car. The car rolled several times. The girl was not wearing a seat belt and was ejected from the vehicle. She died from head trauma.*

## 6. Motor Vehicle Driver Deaths (Including Motorcyclists)

### Key Findings

- Utah teen drivers under age 19 had higher rates of *motor vehicle* crashes resulting in deaths than any other age group under the age of 65.
- Teens from *rural* and *frontier* areas had higher driver death rates than teens from *urban* areas.
- August was the month with the highest number of *motor vehicle* driver deaths, with the majority taking place on Friday, Saturday, and Sunday.
- Nearly half of the teen drivers who died were not wearing a *seat belt*.

For data years 2005-2007, Utah teen drivers aged 16-19 had higher rates of *motor vehicle* crashes (MVCs) resulting in one or more deaths than any other age group under 65. According to law enforcement, drivers aged 16-19 had more driver-related factors/behaviors that contributed to fatal crashes than drivers of any other age group<sup>1</sup>. This section addresses the deaths of teen drivers ages 18 and younger.

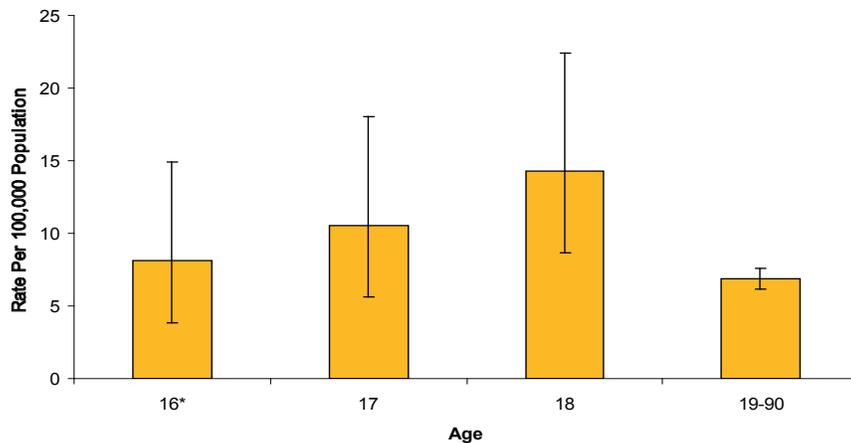
From 2005-2007 there were 42<sup>2</sup> *motor vehicle* deaths among Utah resident drivers aged 18 and under. Note: This included 37 teens who were driving cars, trucks, and SUVs and five teens who were operating motorcycles on roadways<sup>3</sup>. Utah's teen *motor vehicle* death rate was 10.8 per 100,000 population<sup>4</sup>. In addition to these 42 decedents, one teenage driver from out of state also died on a Utah road between 2005-2007.

### Age

There was no *significant difference* between 16-, 17-, and 18-year-olds for driver death rates. Among Utah residents, the driver death rate for 16-year-olds was 8.1 per 100,000 population (N=10), for 17-year-olds was 10.6 per 100,000 population (N=13), and for 18-year-olds was 14.3 per 100,000 population (N=19). When comparing teen driver deaths to the driver deaths of those over age 18, it is noted that only the 18-year-olds have a death rate that is statistically higher than that of adult drivers (Figure 6.A).

## 6. Motor Vehicle Driver Deaths (Including Motorcyclists)

Figure 6.A: Driver Death Rates by Age, Utah Residents, 2005-2007, N=406



\*Due to a small number of cases, findings for the 16-year-old age group must be interpreted with caution.

### Sex

Teen driver decedents were statistically no more likely to be male than female and there was no statistically *significant difference* between male and female teen driver death rates among Utah residents. The male teen driver death rate was 15.6 per 100,000 population (N=30) and the female teen driver death rate was 6.4 per 100,000 population (N=12).

### Race and Ethnicity

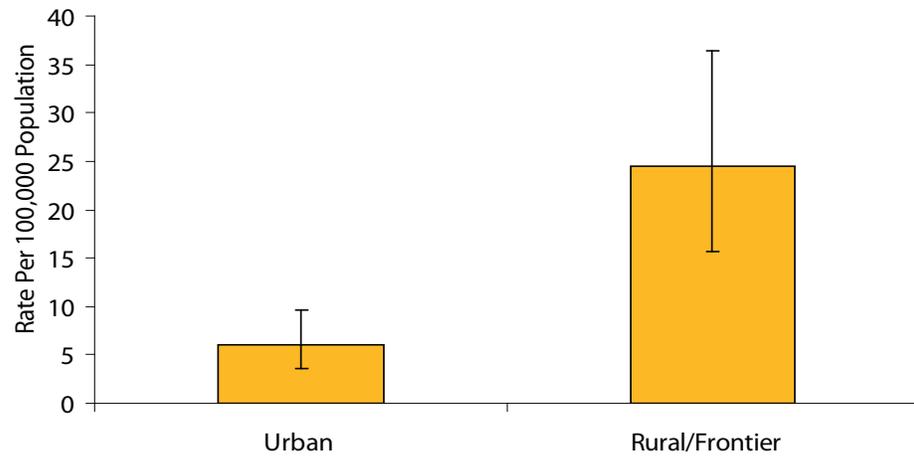
Due to small numbers and the low likelihood that teen drivers are proportionately represented across various racial and ethnic groups, no analysis was undertaken.

### Urban, Rural, and Frontier Residence

Fewer teen drivers who lived in *urban*<sup>5</sup> areas died from crashes than teen drivers who lived in *rural*<sup>6</sup> and *frontier*<sup>7</sup> areas. The *urban* resident<sup>8</sup> driver crash rate was 6.0 per 100,000 population (N=17), while the *rural/frontier* resident driver crash rate was 24.5 per 100,000 population (N=24) (Figure 6.B). Data were unavailable for one decedent.

## 6. Motor Vehicle Driver Deaths (Including Motorcyclists)

Figure 6.B: Urban vs. Rural/Frontier Driver Death Rates, Utah Residents, 2005-2007, N=41\*

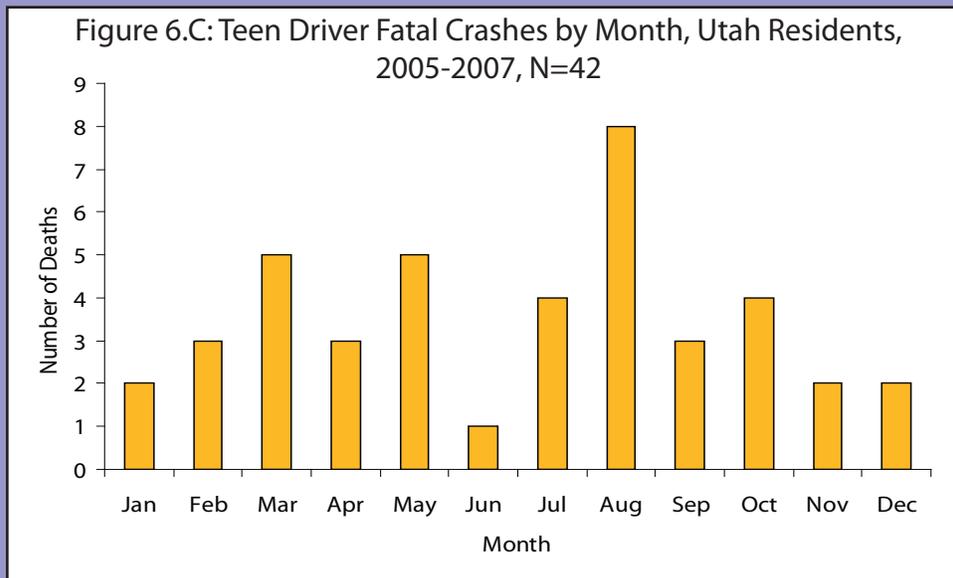


\*Data was unavailable for one decedent.

### Death by Month, Day, and Time

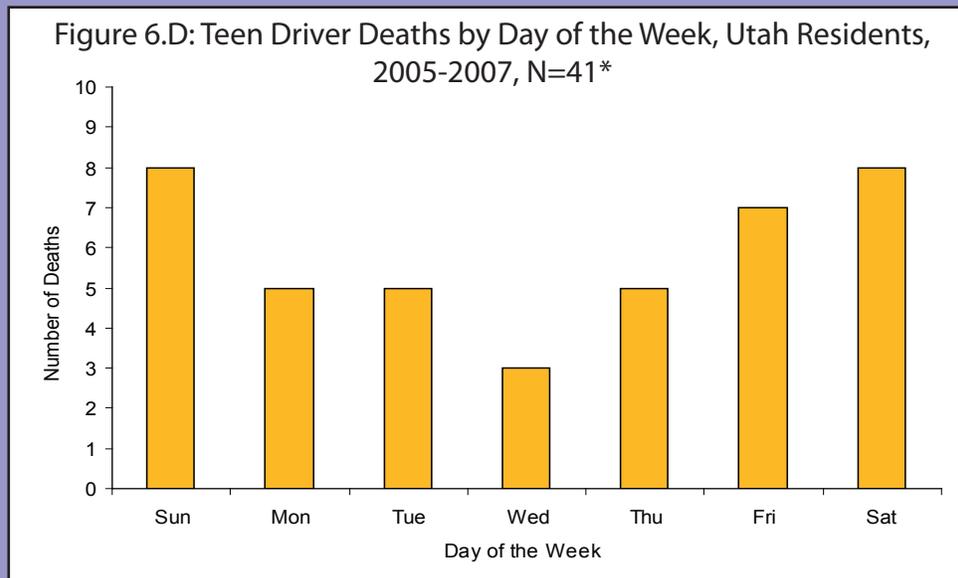
According to national data<sup>9</sup> for years 2005-2007, January has typically had the fewest teen driver crash deaths, where July has typically had the most, though there were no statistically *significant differences* between months for teen driver deaths. Utah had a similar pattern, although the peak month occurred somewhat later, in August rather than in July (Figure 6.C).

## 6. Motor Vehicle Driver Deaths (Including Motorcyclists)



Nearly half (43.9%) of all fatal crashes involving teen drivers occurred from 6:00 p.m. Friday to 5:59 p.m. Sunday. Saturday and Sunday tie as the most deadly days; however, some of the Sunday early morning crashes took place just after midnight and were likely related to activities having taken place on Saturday. There were no statistically *significant differences* between days of the week for teen driver deaths. Nationally<sup>10</sup>, Saturday, followed by Sunday, had the greatest numbers of fatal crashes involving teen drivers. In Utah, Wednesday had the fewest fatal crashes involving teen drivers, while nationally, Tuesday<sup>11</sup> did (Figure 6.D).

## 6. Motor Vehicle Driver Deaths (Including Motorcyclists)

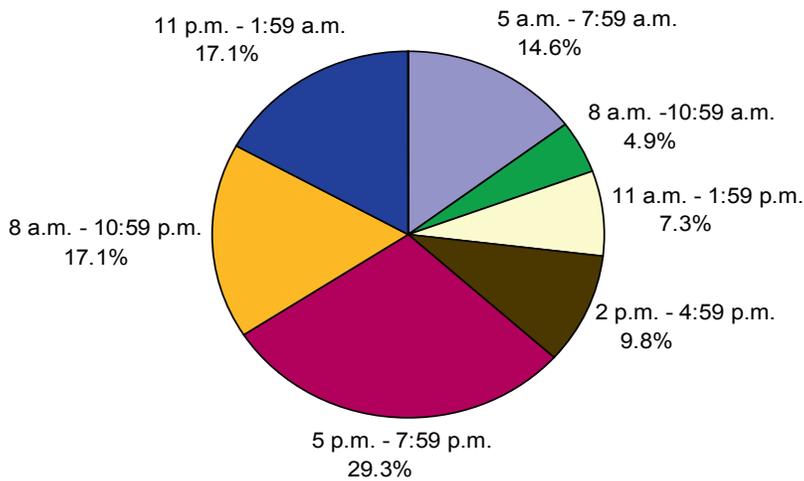


\*Data was unavailable for one decedent.

No fatal crashes involving teen drivers took place between 2:00 a.m. and 5:00 a.m. in Utah from 2005-2007. Evening and nighttime appear to be the most dangerous times of day for teens, with 29.3% (N=12) of crashes taking place between 5:00 p.m. and 7:59 p.m., 17.1% (N=7) taking place between 8:00 p.m. and 10:59 p.m., and 17.1% (N=7) taking place between 11:00 p.m. and 1:59 a.m. While it is tempting to conclude that the evening rush hour commute is an especially dangerous time for teens, it is noted that the bulk of the 5:00 p.m. to 7:59 p.m. deaths took place not during the work week, but on the weekend (Figure 6.E).

## 6. Motor Vehicle Driver Deaths (Including Motorcyclists)

Figure 6.E: Teen Driver Deaths by Time of Day, Utah Residents, 2005-2007, N=41\*



\*Data was unavailable for one decedent.

### Drug and Alcohol Use

Of the 42 crashes where teen drivers died, any record of blood alcohol testing is available for 39 decedents. Of these, 46.1% (N=18) are known to have been tested for the presence of blood alcohol and 22.2% (N=4) had positive test results. Blood alcohol concentration (*BAC*) levels ranged from .02% to .18%, with a *median BAC* of .10%. The remaining 53.8% (N=21) were not tested for the presence of blood alcohol.

Of the 42 crashes where teen drivers died, any record of drug testing is available for 40 decedents. Of these, 20% (N=8) were tested and 25% (N=2) had positive test results. The only drug identified was Tetrahydrocannabinol (*THC*). The remaining 80% (N=32) were not tested for the presence of drugs.

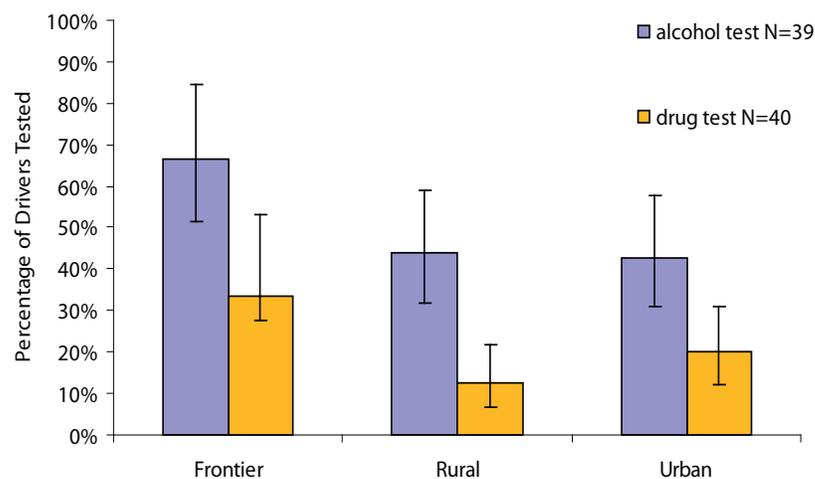
It should be noted that, in cases where more than one vehicle was involved in a crash, law enforcement may have identified the "other driver" rather than the decedent as being at fault, and therefore did not find it necessary to have *BAC* or drug testing conducted.

There was no statistically *significant difference* in the percentage of teen driver decedents tested for alcohol by crash location. In frontier counties, 66.7% (N=6) of decedents were tested for alcohol, as were 43.8% (N=7) in rural counties and 42.9% (N=6) in urban counties. There is a statistically *significant difference* in the percentage of teen driver decedents tested for drugs by crash location. There was more drug testing of decedent drivers in *frontier* (33.3%, N=3) counties than in *rural* (12.5%, N=2) and *urban* (20%, N=3) counties. In *rural* counties, a higher percentage of driver decedents

## 6. Motor Vehicle Driver Deaths (Including Motorcyclists)

were tested for alcohol than for drugs. For *frontier* and *urban* counties, the difference between the percentage of those tested for alcohol and the percentage of those tested for drugs was not statistically significant (Figure 6.F).

Figure 6.F: Percentage of Teen Driver Decedents BAC and Drug Tested by Crash Location, Utah Residents and Non-residents, 2005-2007

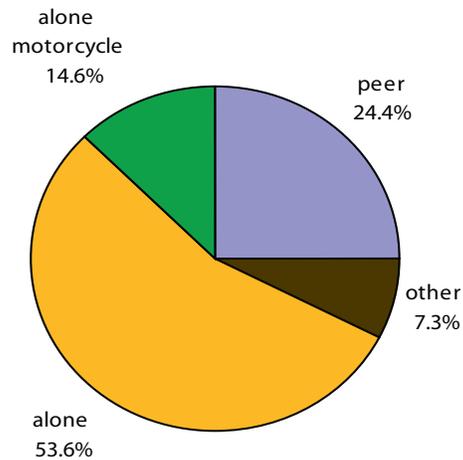


### Vehicle Composition and Driver-related Factors

Overall, there is occupant composition data for 40 of the 43 crashes that involved a teen driver who died as a result of crash injuries, including the out-of-state motorcyclist. More than half of teen driver deaths took place when the decedent was the sole occupant of the vehicle (not including motorcyclists). Additionally, all teen death cases involving teens driving motorcycles involved the driver as the sole rider (i.e., there were no *passengers*) (Figure 6.G).

## 6. Motor Vehicle Driver Deaths (Including Motorcyclists)

Figure 6.G: Vehicle Composition Teen Driver Decedents, Utah Residents and Non-residents, 2005-2007, N=41\*



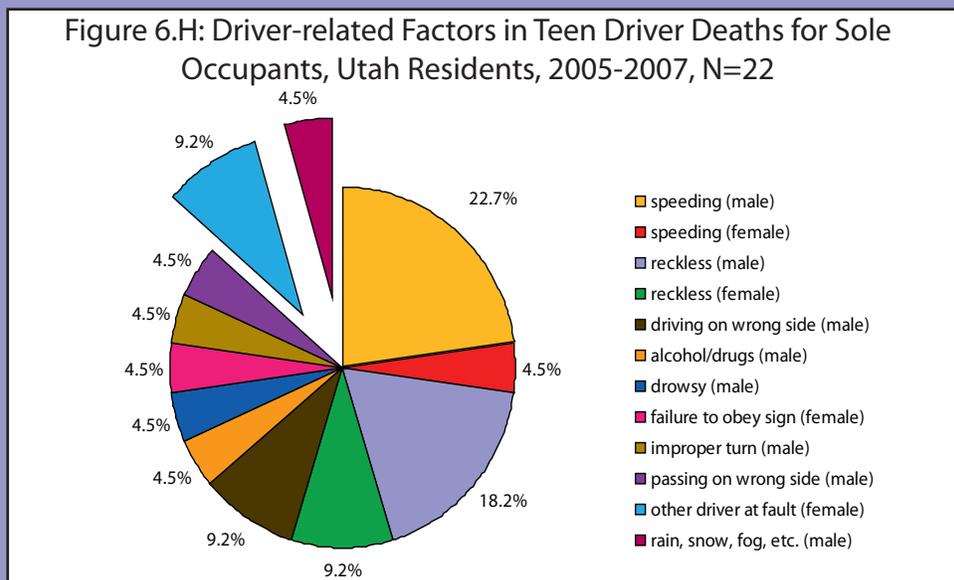
\*Data were unavailable for two decedents.

Of the 22 drivers who were sole occupants, all but three were engaged in behaviors that contributed to their crashes. Speeding and driving recklessly (six occurrences each) were the most frequently identified driver-related behaviors involved in fatal teen sole-occupant crashes. Seventy-five percent of these speeding and reckless driving cases involved male drivers. Other driver-related behaviors that contributed to fatal teen sole-occupant crashes were:

- Driving on the wrong side of the road (unintentionally or intentionally)
- Drowsy, sleepy, asleep, fatigued
- Making other improper turn
- Failure to obey traffic signal, traffic control devices
- Passing on wrong side
- Under the influence of alcohol, drugs, or medication

These behaviors contributed to the deaths of seven teen drivers, six of whom were male. Two decedents (both female) were killed due to the behavior of the "other driver" and one teen driver (male) died in a crash that was due to weather-related factors (Figure 6.H).

## 6. Motor Vehicle Driver Deaths (Including Motorcyclists)

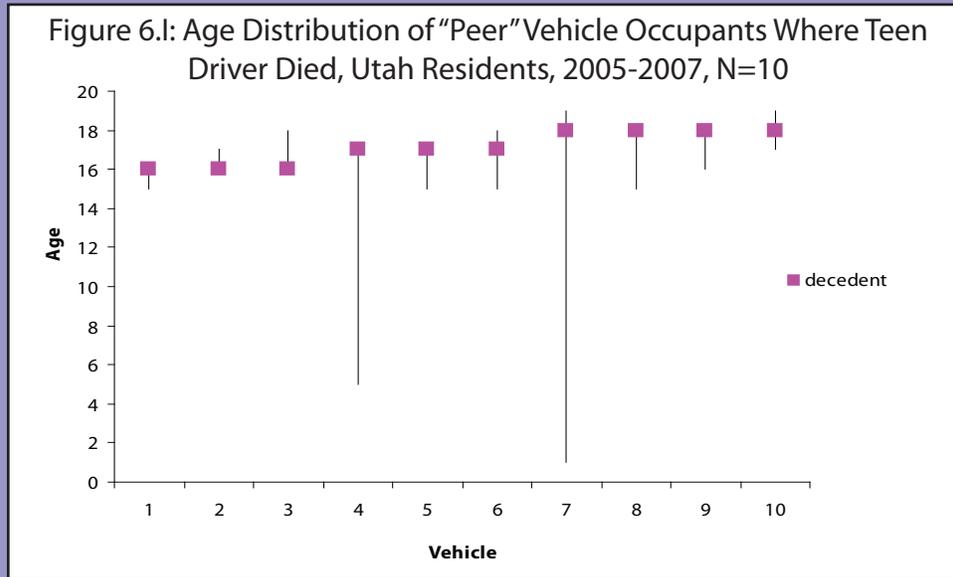


Of the six drivers who were operating motorcycles, all but one were engaged in behaviors that contributed to their crash. That decedent was killed due to the behavior of the “other driver.” Two decedents were driving recklessly and three were driving on the wrong side of the road. All motorcycle operators were male.

For cases where there are composition data available, it appears that 25% (10 deaths) of the total teen drivers who died were in a vehicle with other occupants who ranged in age from 15 to 19<sup>13</sup>. These cases are classified as having a “peer” composition. Overall, there is occupant composition data for 10 total “peer” driver crashes that involved a total of 10 teen driver decedents (i.e., none of these crashes involved multiple teen driver decedents).

With two exceptions (vehicle case numbers 4 and 7 in Figure 8.I), all “peer” vehicles had occupants between the ages of 15 and 19, with an age range of no more than three years between occupants. In vehicle four (Figure 6.I), the youngest occupant was five years old and the oldest was 17 years old (with a 17-year-old driver). In vehicle seven (Figure 6.I), the youngest occupant was one year old and the oldest was 19 years old (with an 18-year-old driver). Among crashes with a “peer” composition, the youngest driver was 16 years old and the oldest was 18 years old (Figure 6.I).

## 6. Motor Vehicle Driver Deaths (Including Motorcyclists)



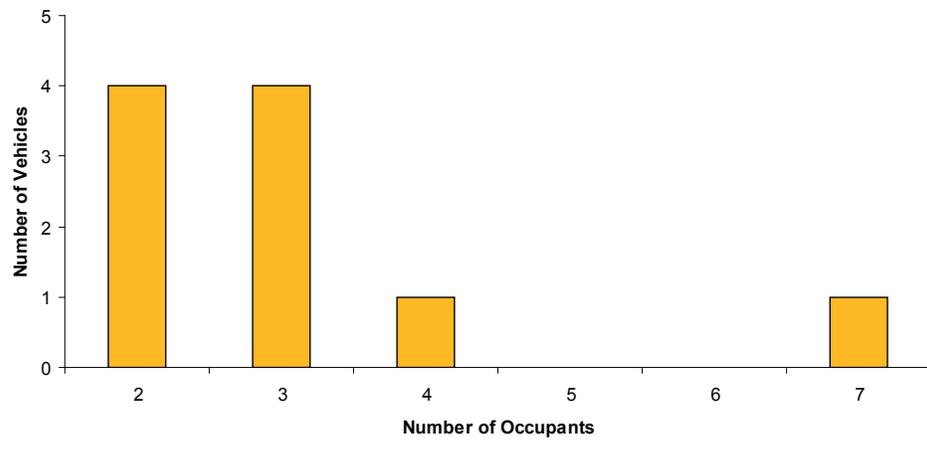
Of the 10 drivers of "peer" vehicles, six were engaged in behaviors that contributed to their crashes. Of the six, one was female. The driver-related behaviors that contributed to fatal teen "peer" crashes were identified as:

- Cellular telephone in use in vehicle
- Drowsy, sleepy, asleep, fatigued
- Making improper turn
- Operating the vehicle in an erratic, reckless, or negligent manner
- Driving too fast for conditions or in excess of posted maximum speed limit
- Under the influence of alcohol, drugs, or medication

Four "peer" cases involved vehicles with just the driver and one *passenger*. There were no "peer" cases that involved vehicles with five or six total occupants. It is noted that the crash involving seven occupants was due to a tire blowout rather than to any behavior of the teen driver. In each of these 10 "peer" crashes, only the driver within the vehicle was killed (Figure 6.J).

## 6. Motor Vehicle Driver Deaths (Including Motorcyclists)

Figure 6.J: Number of Occupants in "Peer" Vehicles Where Teen Driver Died, Utah Residents, 2005-2007, N=10



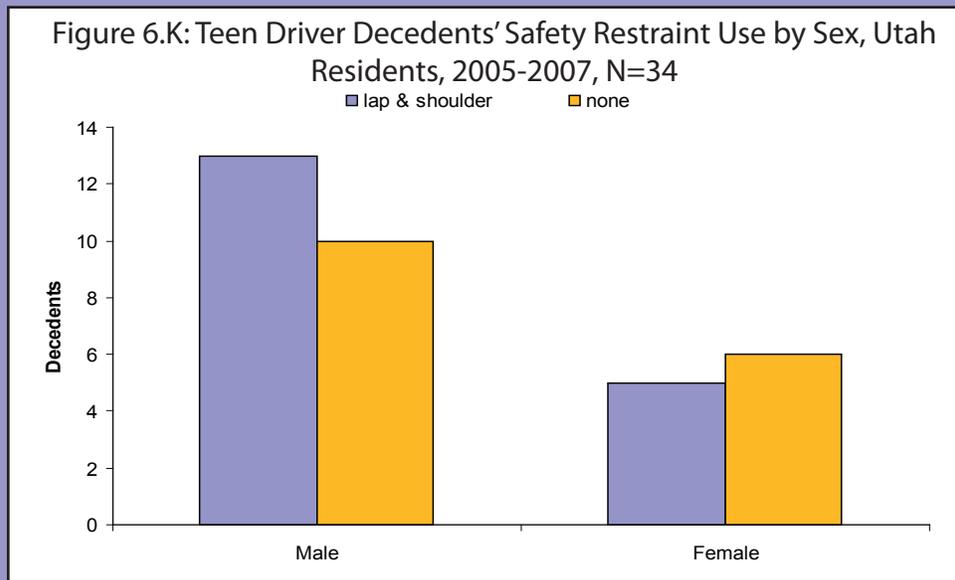
Data exist for three "other" crashes where the ages of the vehicle occupants are known, but the configuration of occupants does not fit the "peer" pattern and the driver was not alone in the vehicle. All three "other" drivers were male and either 17 or 18 years old. Two crashes involved a teen driver and a 25-year-old *passenger* (both of whom died in each of these two cases). In one case, the driver was engaged in improper or erratic lane changing; in the other case, information regarding driver behavior appears to be missing. The third crash involved a teen driver with four *passengers* ranging in age from infancy to age nine (all of whom survived the crash). In this crash, the "other driver" was identified as being at fault.

### Safety Restraint Use

Safety restraint use data are available for 39 decedents<sup>14</sup>. Of these, 48.7% (N=19) did not use any form of safety restraint/device; 46.2% (N=18) used lap and shoulder belts. Two of the six motorcyclists were wearing helmets.

There were no statistically *significant differences* for *seat belt* use between male and female teen driver decedents. Thirteen males used a lap and shoulder belt and 10 used no restraint, whereas five females used a lap and shoulder belt and six used no restraint (Figure 6.K).

# 6. Motor Vehicle Driver Deaths (Including Motorcyclists)



## References

1 Utah Health Status Update: Breaking News, December 2008; Office of Public Health Assessment, Utah Department of Health, January 2009.

2 One decedent was excluded from the analysis due to an initial lack of information about the death. The decedent was identified as having been on a "scooter" but the data source was unclear as to the type of scooter involved. Additional data sources revealed that this decedent died on a Moped type scooter and therefore should have been included as a driver.

3 There were two decedents on scooters or mini-scooters (information is conflicting) that are excluded from this analysis.

4 Rate based on drivers ages 16-18 and for the 16- to18-year old population.

5 *Urban* counties contain 100 or more persons per square mile. *Urban* counties include: Davis, Salt Lake, Utah, and Weber.

6 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.

7 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.

8 By location of residence.

9 Fatality Analysis Reporting System (FARS) query 2005-2007

10 FARS query 2005-2007

11 FARS query 2005-2007

12 FARS query 2005-2007; FARS data exist for 40 teen driver decedents, but *BAC* data are "unknown" in one instance.

13 There are two exceptional cases where decedent drivers had a young child as a *passenger* in addition to one or more peers.

14 FARS query 2005-2007

# Recommendations

- Continue to support booster seat and child restraint laws.
- Continue to support the “Spot the Tot” program and evaluate the program to determine its effectiveness.
- Increase teen driving awareness and education in *rural* areas of Utah.
- Continue to support the Utah Teen Driving Task Force and the Utah Highway Safety Office in their efforts to educate teens on safe driving.
- Pass primary safety belt legislation for all drivers in Utah.
- Increase education of teens on the proper use of *seat belts*.
- Pass legislation that requires helmets for drivers and *passengers* of motorcycles and motorized scooters.

# Motor Vehicle Passenger Deaths



*A 16-year-old female was riding with friends in an SUV. The driver was speeding and lost control of the vehicle, which then rolled. The teen passenger was not wearing a seat belt and was ejected from the vehicle. She died from massive head trauma.*

# 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

## Key Findings

- Children from *rural/frontier* areas had significantly higher rates of *passenger* deaths than children from *urban* areas.
- When a peer was the driver of the vehicle, his/her average age was 16.
- Nearly half of the decedents were not using a safety restraint.

A *passenger* is any person other than the driver who is in or upon a road vehicle (including persons riding on the exterior of a *motor vehicle*)<sup>1</sup>. Included are both *motor vehicles* in- and not-in-transport<sup>2</sup>. In addition to the designated seats in a car, truck, SUV, etc., *passenger* seating positions can include the following:

- Motorcycle *passenger*
- Sleeper section of cab (truck)
- Enclosed cargo area (e.g., back of a pickup truck)
- Unenclosed cargo area in or on a trailing unit
- Riding on the vehicle exterior (i.e., “car surfing”)
- Sitting on the driver’s lap

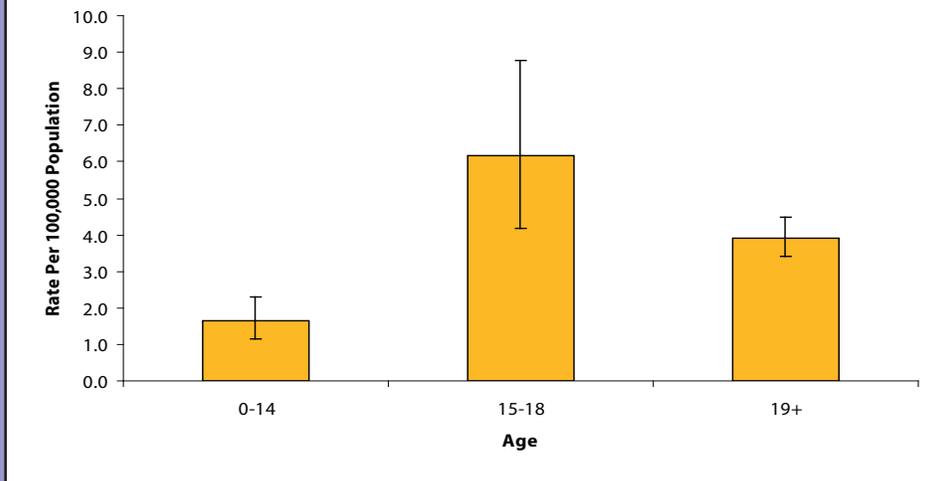
From 2005-2007 there were 65 unintentional *motor vehicle* deaths (in a total of 57 separate crashes) among Utah resident *passengers* aged 18 and under. This included 64 decedents who were *passengers* in cars, trucks, and SUVs and one decedent who was a *passenger* on a motorcycle on a roadway. The resulting *passenger* death rate was 2.5 per 100,000 population. In addition to these 65 Utah residents, there were 14 *passengers* under age 18 from out of state (in a total of 14 separate crashes) who also died on Utah roads from 2005-2007. Nearly one-fifth of child *motor vehicle passenger* deaths were out-of-state residents.

## Age

There was a statistically *significant difference* in *passenger* death rates between teens ages 15-18 and children ages birth to 14. The *passenger* death rate for those ages 15-18 was 6.2 per 100,000 population (N=31) and 1.6 per 100,000 population for those ages 0 to 14 (N=34) (Figure 7.A). Additionally, data from the Utah Crash Summary<sup>3</sup> are included to show child *passenger* death rate comparisons to the adult population. There is no statistically *significant difference* between 15-to 18-year-olds and adults aged 19 and older, who had a *passenger* death rate of 3.9 per 100,000 population.

# 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

Figure 7.A: Resident Passenger Deaths by Age, Utah Residents, 2005-2007, N=65 (for ages 0-18)



## Sex

There was no difference in death rates between male and female *passengers* who died in *motor vehicle* crashes. The death rate was 2.6 per 100,000 population (N=34) for males and 2.5 per 100,000 population (N=31) for females.

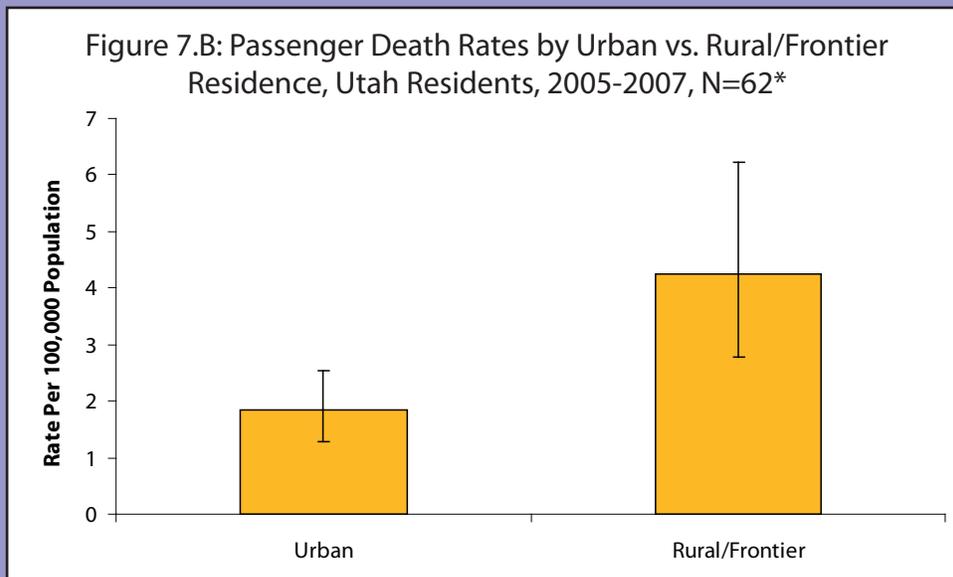
## Race and Ethnicity

There was no difference in rates between *white non-Hispanic passengers* and *passengers* of "other" *races/ethnicities*. The death rate for *white non-Hispanic passengers* was 2.5 per 100,000 population (N=52) and 2.6 per 100,000 (N= 13) for "other" *passengers*.

## Urban, Rural, and Frontier Residence

There was a statistically significant *urban*<sup>4</sup>, *rural*<sup>5</sup>, and *frontier*<sup>6</sup> difference<sup>7</sup> in child *passenger* death rates based upon the county of residence. The *urban* resident *passenger* death rate was 1.8 per 100,000 population (N=36) while the *rural/frontier* resident *passenger* death rate was 4.5 per 100,000 population (N=26) (Figure 7.B). Data were unavailable for three decedents.

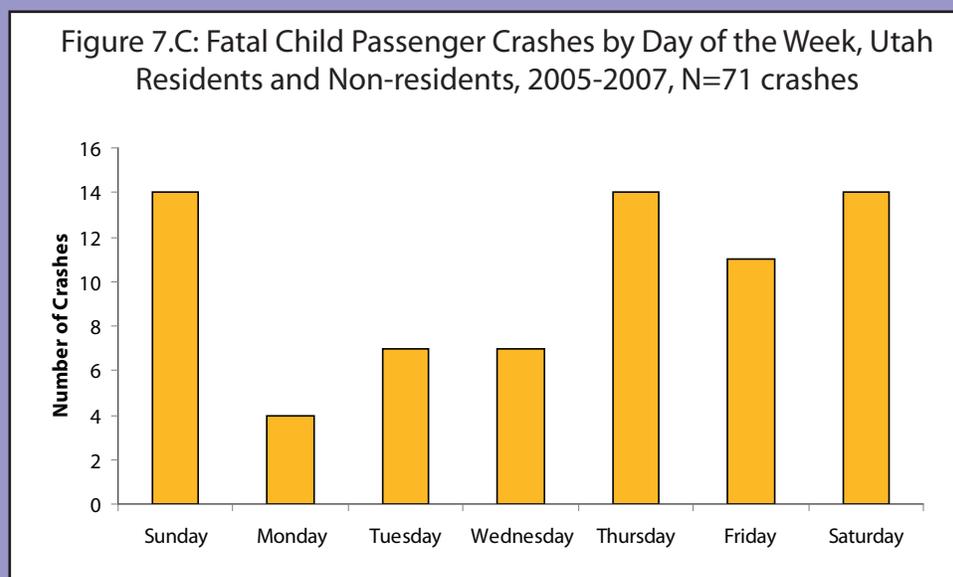
## 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)



\*Data were unavailable for three decedents.

### Day of the Week

There was no statistically *significant difference* between days of the week on which crashes with child *passengers* who died occurred (Figure 7.C).

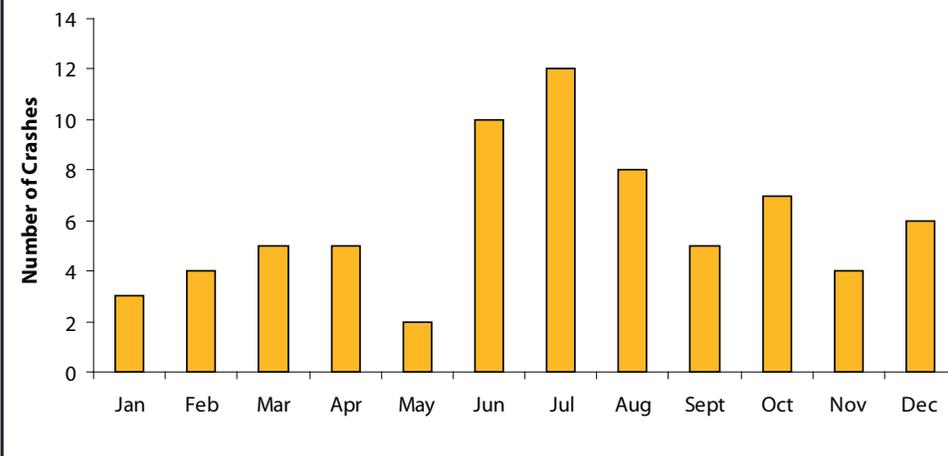


## 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

### Crashes by Month and Time of Day

There were no statistically *significant differences* between months of the year for fatal child *passenger* crashes. Summer months (June, July, and August) had the highest numbers of *passenger* deaths. During these three months, 42.3% of fatal child *passenger* crashes for persons ages birth to 18 occurred (Figure 7.D).

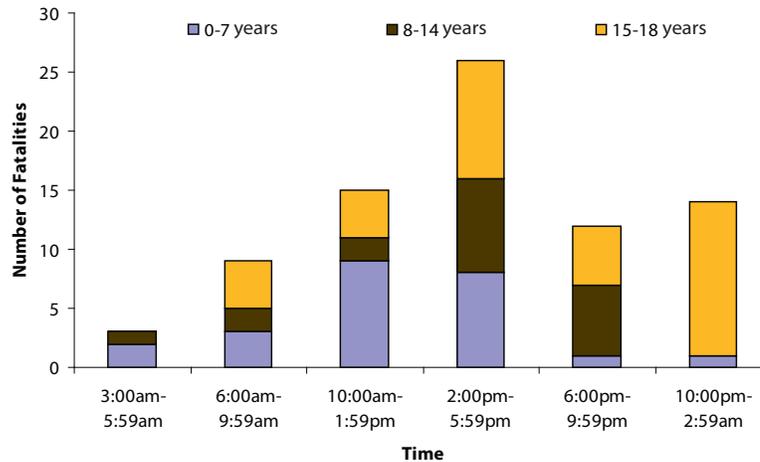
Figure 7.D: Fatal Child Passenger Crashes by Month, Utah Residents and Non-residents, 2005-2007, N=71



Younger child *passengers* died from crashes that took place earlier in the day and older child (teen) *passengers* died from crashes that took place later in the day. More than 70% of 0- to 7-year-olds died from crashes that took place between 10:00 a.m. and 6:00 p.m.; more than 73% of 8- to 14-year-olds died from crashes that took place between 2:00 p.m. and 10:00 p.m.; and more than 78% of 15- to 18-year-olds died from crashes that took place between 2:00 p.m. and 3:00 a.m. (Figure 7.E).

# 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

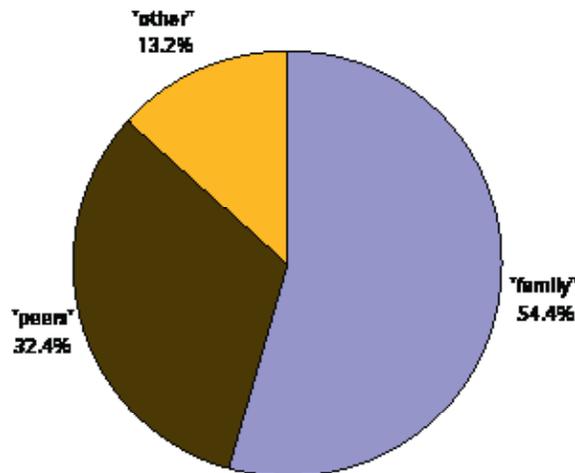
Figure 7.E: Passenger Death Crashes by Age Group and Time of Day, Utah Residents and Non-residents, 2005-2007, N=79



## Vehicle Composition

Overall, there are occupant composition data for 33 “family”<sup>8</sup> crashes that involved a total of 37 children. In addition to 25 crashes involving Utah residents, there were eight “family” crashes in Utah that involved non-residents. It appears that 46.8% of the child decedent/s (N=37) were in a vehicle with a driver at least old enough to be their parent or grandparent (Figure 7.F).

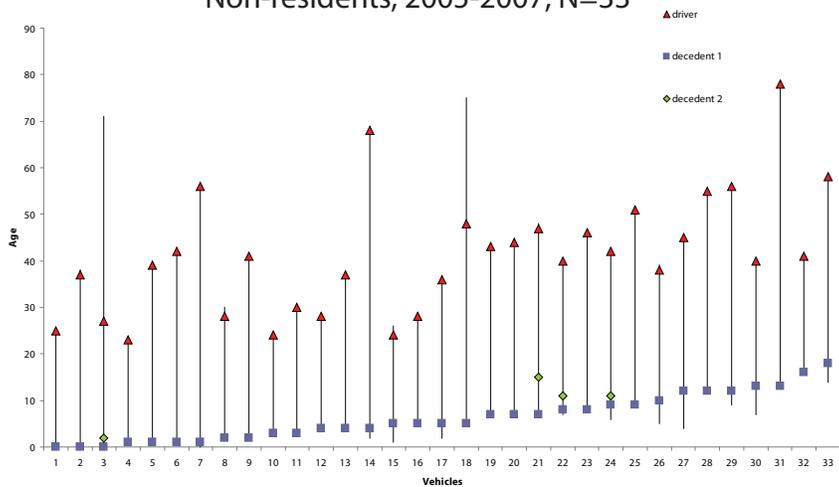
Figure 7.F: Vehicle Composition of Decedent Child Passengers, Utah Residents and Non-residents, 2005-2007, N=68



## 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

These cases are classified as having a “family” composition. Among crashes with a “family” composition, the youngest driver was 23 years old and had a one-year-old *passenger* who died (decedent-incident 4 in Figure 7.G). The oldest driver was 78 years old and had a 13-year-old *passenger* who died (decedent-incident 34 in Figure 7.G). There were four crashes in which two child *passengers* died in each crash (Figure 7.G). Among “family” crashes, the average decedent age was 6.6 years and the average driver age was 36.5 years.

Figure 7.G: Age of “Family” Vehicle Occupants, Utah Residents and Non-residents, 2005-2007, N=33\*

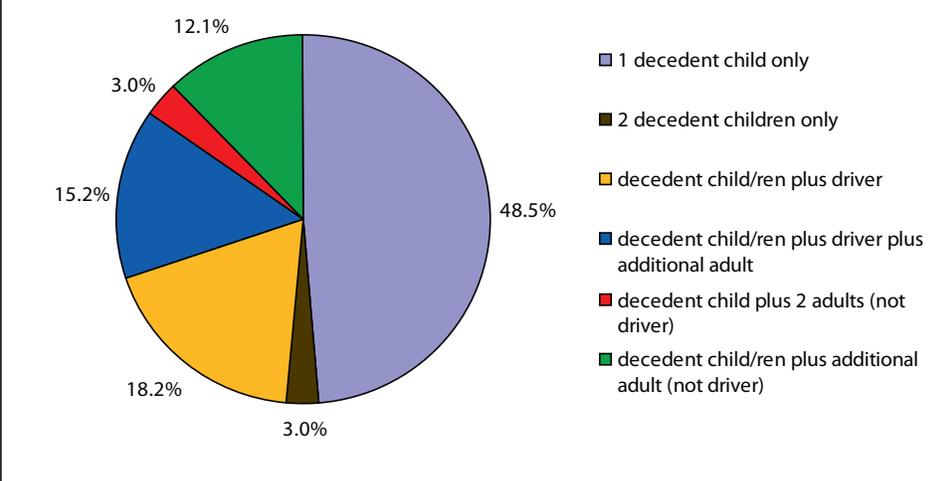


\*Data were unavailable for 29 Utah residents and eight out-of-state decedents.

In nearly 51.5% of the “family” crashes, the sole decedent/s were child/ren ages 18 and younger (Figure 7.H). Of 33 “family” crashes, 11 drivers and 11 adult *passengers* also died due to injuries.

## 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

Figure 7.H: Total Deaths of “Family” Vehicle Composition, Utah Residents and Non-residents, 2005-2007, N=33 crashes

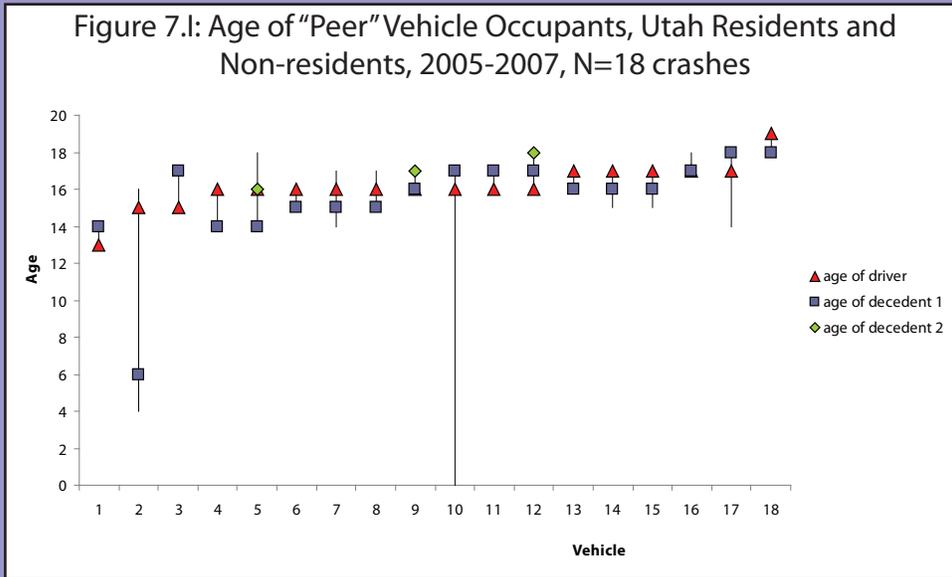


Where crash records were available, there were 18 crashes (17 Utah resident crashes and one out-of-state resident crash) where two or more teen peers were in the vehicle (there were no adults in the vehicles) and there was at least one *passenger* death. One of these crashes involved multiple teens in a vehicle with two much younger children, one of whom was the decedent; otherwise, the decedents were all within two years' age difference from the drivers. These cases are classified as having a “peer” composition. These 18 crashes with a “peer” composition resulted in 22 *passenger* deaths. Note that there was one motorcycle crash where the teen driver and decedent *passenger* were less than two years apart in age.

With two exceptions (vehicle case numbers 1 and 16 in Figure 7.I), all “peer” vehicles had occupants between the ages of 13 and 19 with an age range of no more than four years between occupants. In vehicle 1, the youngest occupant was four years old and the oldest was 16 years old (with a 15-year-old driver). In vehicle 16, the youngest occupant was under age one and the oldest was 17 years old (with a 16-year-old driver). Note that in vehicle 10, there was an infant who survived the crash (Figure 7.I).

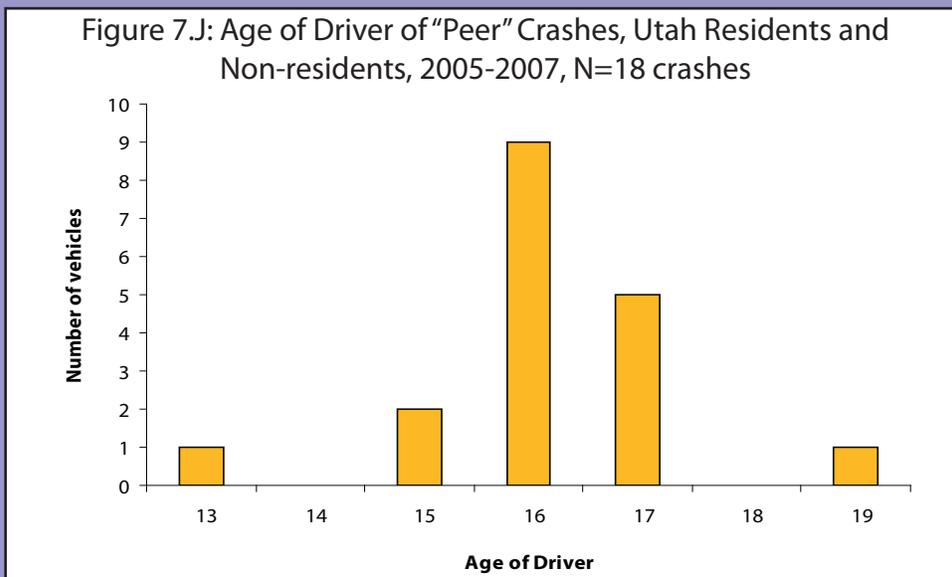
# 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

Figure 7.I: Age of "Peer" Vehicle Occupants, Utah Residents and Non-residents, 2005-2007, N=18 crashes



Among crashes with a "peer" composition, the youngest driver was 13 years old and the oldest was 19 years old. Most "peer" crashes involved 16-year-old drivers. There were no peer crashes involving 18-year-old drivers (Figure 7.J).

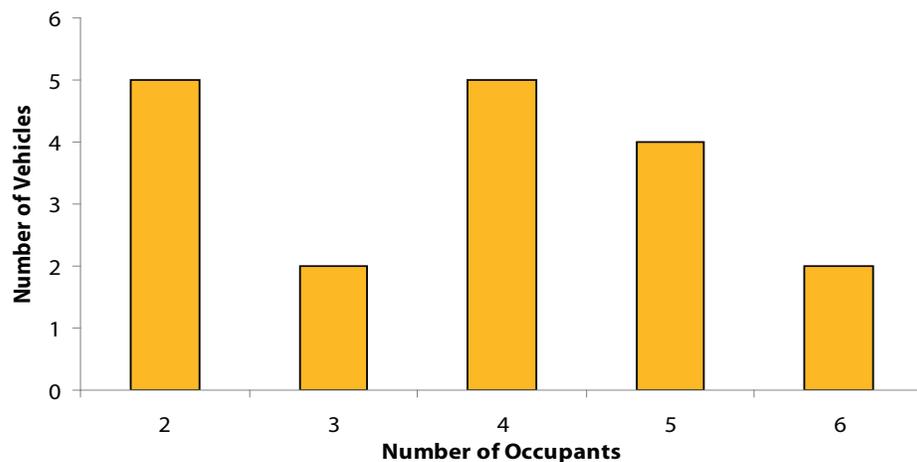
Figure 7.J: Age of Driver of "Peer" Crashes, Utah Residents and Non-residents, 2005-2007, N=18 crashes



## 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

Five “peer” cases involved vehicles with just the driver and one *passenger*. There were no “peer” cases that involved vehicles with greater than six total occupants. Three out of 17 (17.6%) of the “peer” cases involved multiple deaths. However, in none of these cases was the driver killed (Figure 7.K).

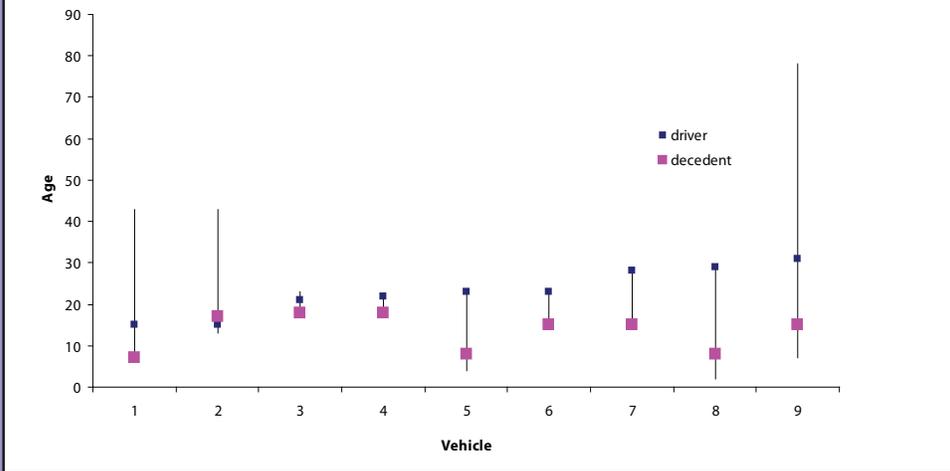
Figure 7.K: Number of Occupants in “Peer” Vehicles, Utah Residents and Non-residents, 2005-2007, N=17 crashes\*



Data exist for nine resident and non-resident crashes (11.4% of the total *passenger* cases) where the ages of the vehicle occupants are known, but the configuration of occupants does not fit the “family” or “peer” pattern. Overall, for these “other” cases, the ages of occupants ranged from two years (in vehicle 8 in Figure 7.L) to 78 years (in vehicle 9 in Figure 7.L) and the age of the drivers ranged from 15-31 years (Figure 7.L).

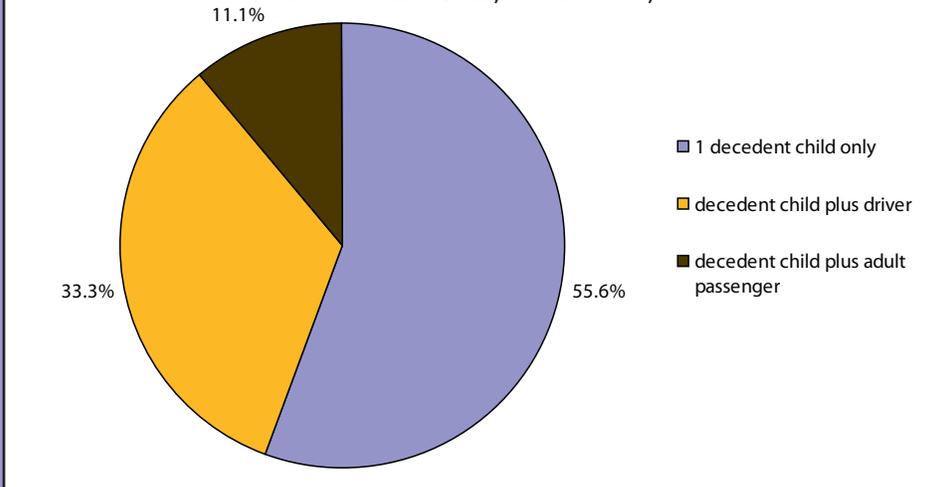
# 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

Figure 7.L: Age of "Other" Vehicle Occupants, Utah Residents and Non-residents, 2005-2007, N=9



In two of the nine cases, there was a 15-year-old driver, an adult (at least 25 years older than the driver), and fewer than four children in each vehicle. Among the "other" crashes, 44.4% (N=4) involved an adult death in addition to the child passenger death. The other 55.5% (N=5) resulted in child passenger deaths only (Figure 7.M).

Figure 7.M: Total Deaths of "Other" Vehicle Composition, Utah Residents and Non-residents, 2005-2007, N=9



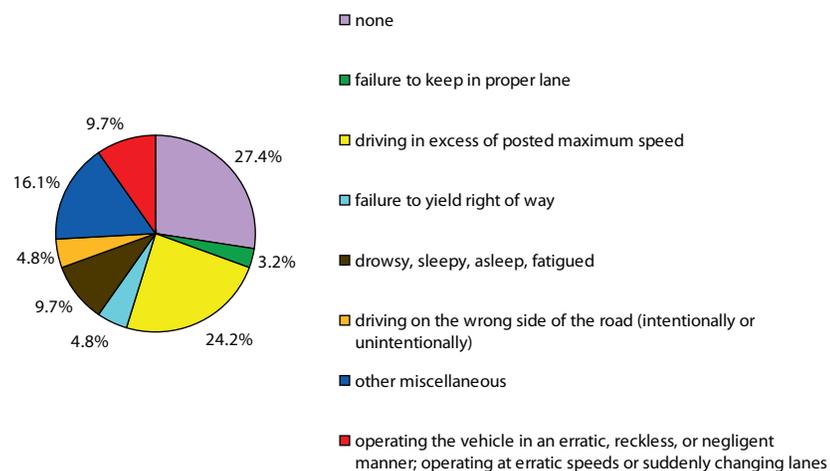
## 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

The total number of occupants for “other” crashes ranged from 2-13 occupants.

### Driver-related Factors

Crash reports exist for 62 crashes that involved a total of 70 child *passenger* decedents. These reports<sup>11</sup> described whether the driver of the vehicle was engaged in any behavior that contributed to the crash. For 27.4% of the crashes with a crash report, the driver did not appear to have engaged in any behavior that contributed to the crash. Where there are data, the primary driver-related factor in crashes involving child *passenger* deaths was “driving in excess of the posted maximum speed”<sup>12</sup> (24.2%) (Figure 7.O).

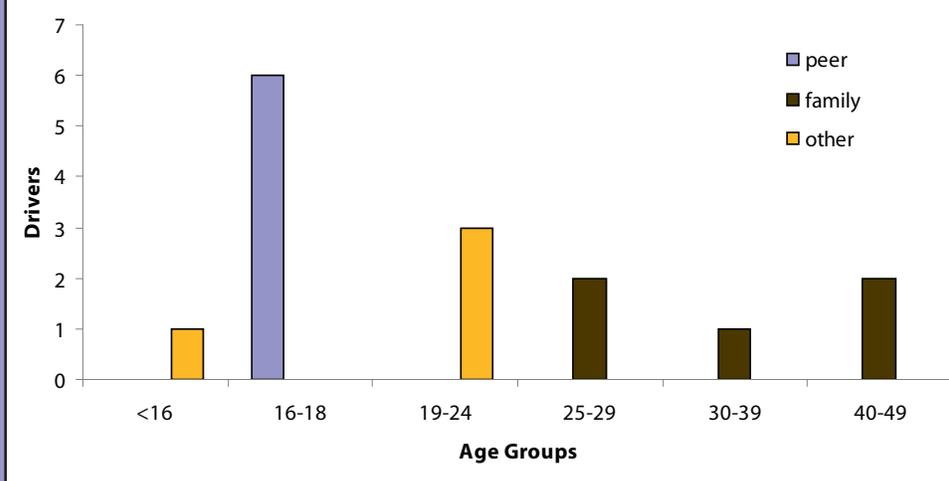
Figure 7.O: Driver-related Factors in Child Passenger Deaths, Utah Residents and Non-residents, 2005-2007, N=62 crashes



Nearly half (N=6) of the drivers for whom speeding was identified as the primary driver-related factor were aged 16 to 18 (Figure 7.P). Overall, 46.7% (N=7) of the speeding drivers were teens and in peer vehicles.

## 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

Figure 7.P: Age Distribution of Speeding Drivers of Child Passenger Decedents, Utah Residents and Non-residents, 2005-2007, N=15



The age distribution of reckless/negligent drivers of child decedent *passengers* shows that four of the six drivers who had “operating the vehicle in an erratic, reckless, or negligent manner, operating at erratic or suddenly changing speeds” identified as the primary driver-related factor were in “family” vehicles and were between the ages of 19 and 45.

Data are available for five of the six drivers who were identified as being fatigued or having fallen asleep. These drivers ranged in age from 24 to 56. Three of the five were from out of state, and four of the five had been traveling on I-15.

Other miscellaneous driver-related factors included:

- Overcorrecting
- Improper or erratic lane changing
- Under the influence of alcohol, drugs or medication
- Operating the vehicle in careless or inattentive manner
- Overloading or improper loading of vehicle with *passengers* or cargo
- Passing with insufficient distance or inadequate visibility or failing to yield to overtaking vehicle
- Driver has not complied with learner’s permit or intermediate driver license restrictions (not including *GDL* restrictions)

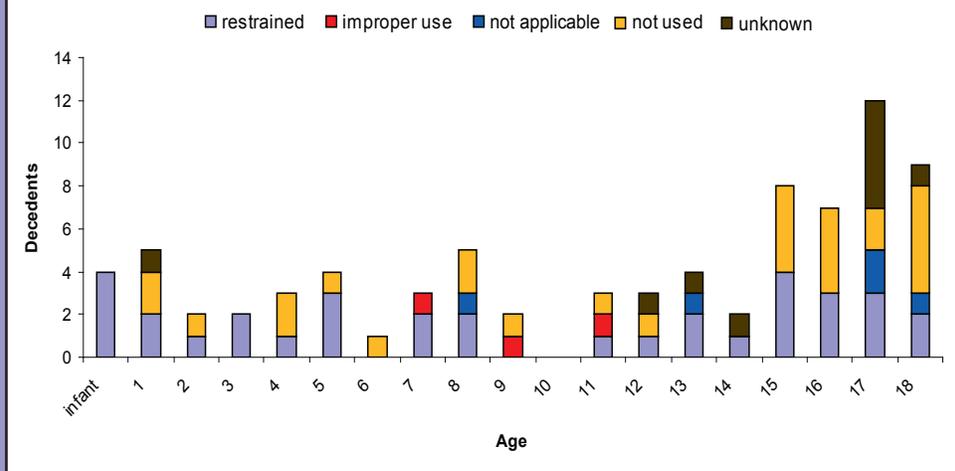
### Safety Restraint Use

Safety restraint use data are available for 69 decedents<sup>13</sup>. Of these, 46.4% (N=32) either did not use any form of safety restraint/device or use of a restraint did not apply<sup>14,15</sup> 21.7% (N=15) used lap and shoulder belt, 17.4% (N=12) used a *child safety seat*/booster

## 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

seat properly, and 10.1% (N=7) were using a lap belt. Additionally, 4.3% (N=3) of decedents were using either a seatbelt or *child safety seat* improperly. (Figure 7.R)

Figure 7.R: Passenger Decedent Safety Restraint Use by Age, Utah Residents and Non-residents, 2005-2007, N=79



Examples of improper use of safety equipment included:

- Children wearing a lap belt but with the shoulder belt under their arm or over their head; and
- Car seats that were not anchored or belted to the vehicle.

In cases where an injured child has been removed from a wrecked vehicle before law enforcement arrived at the scene, officers can typically make the determination as to safety restraint use by the type and level of injury. This is especially true in cases of car seats/booster seats<sup>16</sup>.

Twenty-seven decedents were located in a position within a vehicle with access to *seat belts* but did not use them. Three decedents were identified as improperly restrained. Utah crash data<sup>17</sup> have shown that for *infants* and children less than nine years of age, use of safety restraints decreases as a child gets older.

### Utah vs. U.S.

Data for *passengers* under age 19 are not readily available through online databases. Therefore, the national *motor vehicle* death rate for all ages is used. Utah had a significantly lower overall child motor vehicle traffic death rate than the U.S. from 2005-2006. The U.S. rate is 6.8 per 100,000 population (N=15,862)<sup>18</sup> and the Utah rate is 5.5 per 100,000 population (N=142)<sup>19</sup>.

# 7. Motor Vehicle Passenger Deaths (Including Motorcycle Passengers)

## References

1 Fatality Analysis Reporting System (FARS) (National Highway Traffic Safety Administration), the Manual on Classification of Motor Vehicle Traffic Accidents, 6th Edition- ANSI D16.1-1996 (American National Standards Institute), and the "DI-9" (Crash Report) 2005 Training Manual (Utah Department of Public Safety, Highway Safety Office).

2 "Not in transport" meaning not moving.

3 Years 2005-2007; Utah Department of Public Safety, Highway Safety Office 388 W 5400 S Salt Lake City, UT 84118; [www.highwaysafety.utah.gov](http://www.highwaysafety.utah.gov).

4 *Urban* counties contain 100 or more persons per square mile. *Urban* counties include: Davis, Salt Lake, Utah, and Weber.

5 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.

6 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.

7 By location of residence.

8 True relationships among vehicle occupants are not known, though the age of the occupants is known and the composition of the occupants appears to resemble that of a nuclear family. Other categories have been created to accommodate other types of composition of occupants based upon their ages.

9 Drivers with multiple child victims were counted only one time when calculating the average driver age.

10 There is one exceptional case of a six-year-old decedent in the car with a 15-year-old driver. The oldest occupant in this vehicle was 16 years old. The total make-up of this vehicle was three teens and two young children.

11 Fatality Analysis Reporting System query 2005-2007.

12 Refers to driving in excess of the posted maximum speed limit.

13 Fatality Analysis Reporting System query 2005-2007.

14 At least two decedents were riding in the back of pickup trucks.

15 The motorcycle *passenger* was not wearing a helmet.

16 Utah Highway Safety Office, Utah Department of Public Safety

17 Total crashes (not just deaths); 2008 Utah Crash Summary, Utah Department of Public Safety, Highway Safety Office 388 W 5400 S Salt Lake City, UT 84118; [www.highwaysafety.utah.gov](http://www.highwaysafety.utah.gov)

18 WISQARS

19 IBIS, GOBP

# Recommendations

- Continue to support booster seat and child restraint laws.
- Continue to support the “Spot the Tot” program and evaluate the program to determine its effectiveness.
- Increase teen driving awareness and education in *rural* areas of Utah.
- Continue to support the Utah Teen Driving Task Force and the Utah Highway Safety Office in their efforts to educate teens on safe driving.
- Pass primary safety belt legislation for all drivers in Utah.
- Increase education of teens on the proper use of *seat belts*.
- Pass legislation that requires helmets for motorcycle and motorized scooter drivers and passengers.

# Motor Vehicle Pedestrian Deaths



*A two-year-old girl ran behind a car that was backing out of a driveway. The driver didn't see the child and backed over her. She died from extensive head trauma.*

# 8. Motor Vehicle Pedestrian Deaths (Including Pedal and Other Cyclists)

## Key Findings

- Most *motor vehicle pedestrian* deaths among younger children (ages 0-4) occurred in residential driveways. The majority of older children (ages 5-18) were hit while crossing a street.

From 2005-2007 there were 34<sup>1</sup> child *motor vehicle pedestrian* deaths in Utah, for an overall rate of 1.3 per 100,000 population. All decedents were Utah residents. Cases have been identified from multiple data sources, including: the Utah Department of Public Safety, Utah Office of Vital Records, Medical Examiner Database, and Fatality Analysis Reporting System. Half of the deaths resulted from injuries that took place at homes, usually in residential driveways.

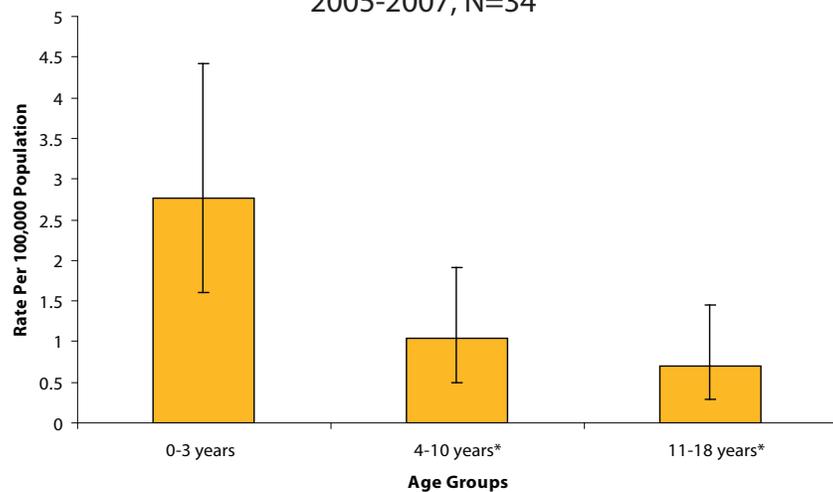
## Utah vs. U.S.

There was no difference between Utah and U.S. rates for child *pedestrian/cyclist* deaths for years 2005-2006.<sup>2</sup> The Utah rate was 1.3 per 100,000 population (N=22), while the U.S. rate was 1.2 per 100,000 population (N=1940).

## Age

There was a statistically *significant difference* in the number of *motor vehicle pedestrian* deaths occurring in the 0- to 3-year-old age group (2.8 per 100,000 population, N=17) and 11- to 18-year-old age group (0.7 per 100,000 population, N=7). The 4- to 10-year-old age group (1.0 per 100,000 population, N=10) was not different from either the older or younger group (Figure 8.A). Most younger children were hit in residential driveways, whereas teens/older children were hit while crossing a street.

Figure 8.A: Pedestrian Death Rates by Age Group, Utah Residents, 2005-2007, N=34



\* Due to a small number of cases, findings for these ages must be interpreted with caution.

## 8. Motor Vehicle Pedestrian Deaths (Including Pedal and Other Cyclists)

### Sex

There was no statistically *significant difference* between the rate of *motor vehicle pedestrian* deaths among males and females. From 2005-2007, the *motor vehicle pedestrian* death rate was 1.4 per 100,000 population (N=18) for males and 1.3 per 100,000 population (N=16) for females.

### Race and Ethnicity

There was no *significant difference* by *race* and *ethnicity* for child *motor vehicle pedestrian* death injuries. The *white non-Hispanic* injury death rate was 1.3 per 100,000 population (N= 27), while the "other" injury death rate was 1.4 per 100,000 population (N=7).

### Urban, Rural, and Frontier Residence

There was no significant *urban*<sup>3</sup>, *rural*<sup>4</sup>, or *frontier*<sup>5</sup> difference<sup>6</sup> for *pedestrian* deaths based upon the county of residence. The *urban pedestrian* death rate was 1.2 deaths per 100,000 population (N=23) and the *rural/frontier pedestrian* death rate was 1.8 deaths per 100,000 population (N=11).

### Day of Week and Time

Forty percent (N=6) of the fatal driveway injuries took place on a Friday or Saturday and 86.6% (N=13) of fatal driveway injuries took place between 11:00 a.m. and 5:00 p.m.

Thirty-five percent (N=6) of *pedestrian* injuries that took place in other locations happened between 1:00 a.m. and 5:00 p.m. and 52.9% (N=9) occurred between 6:00 p.m. and 11:00 p.m. These later night deaths were among older teens. There was no discernable pattern as to any particular days of the week having a greater frequency of non-driveway *pedestrian* deaths.

### References

1 2006 is the most recent year for U.S. data.

2 One decedent was excluded from the analysis due to an initial lack of information about the death. The decedent was identified as having been on a "scooter," but the data source was unclear as to the type of scooter involved. Additional data sources revealed that this decedent was using a foot-powered scooter and therefore should have been included as a pedestrian.

3 *Urban* counties contain 100 or more persons per square mile. *Urban* counties include: Davis, Salt Lake, Utah, and Weber.

4 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.

5 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.

6 By location of residence.

# Recommendations

- Continue to support the “Spot the Tot” program and evaluate the program to determine its effectiveness.
- Continue to support the Utah Highway Safety Office and Zero Fatalities “Heads Up Utah” campaign.
- Continue to collect data on *pedestrian* and *motor vehicle* injuries and deaths. Data collection should include private property *pedestrian* injuries and deaths in addition to those occurring on public property.

# Infant Sleep Deaths



# 9. Infant Sleep Deaths

## Key Findings

- Two of the most common factors associated with *infant* sleep-related deaths were: 1) the *infant* being put down to sleep on an adult bed; and 2) the practice of unsafe *co-sleeping*.

Of the 131 *infants* who died from injury or *Sudden Infant Death Syndrome (SIDS)* from 2005-2007, 80.9% (N=106) were sleep related<sup>1</sup>. In this report, *infant* sleep deaths are classified into four categories, which are described in detail in sections 9a, 9b, 9c, and 9d:

1. *Sudden Infant Death Syndrome (SIDS)* (N=43)
2. *SIDS vs. Asphyxia Deaths* (N=34)
3. Unintentional Injury Deaths During Sleep (N=19)
4. Other *Infant* Sleep Deaths of *Undetermined Manner* (N=10)

Data are presented according to categories based upon cause and *manner of death*. However, although the underlying causes or circumstances of these deaths may have differed, most *infant* sleep deaths involved at least one avoidable risk factor.

## Leading Causes of Infant Death in Utah

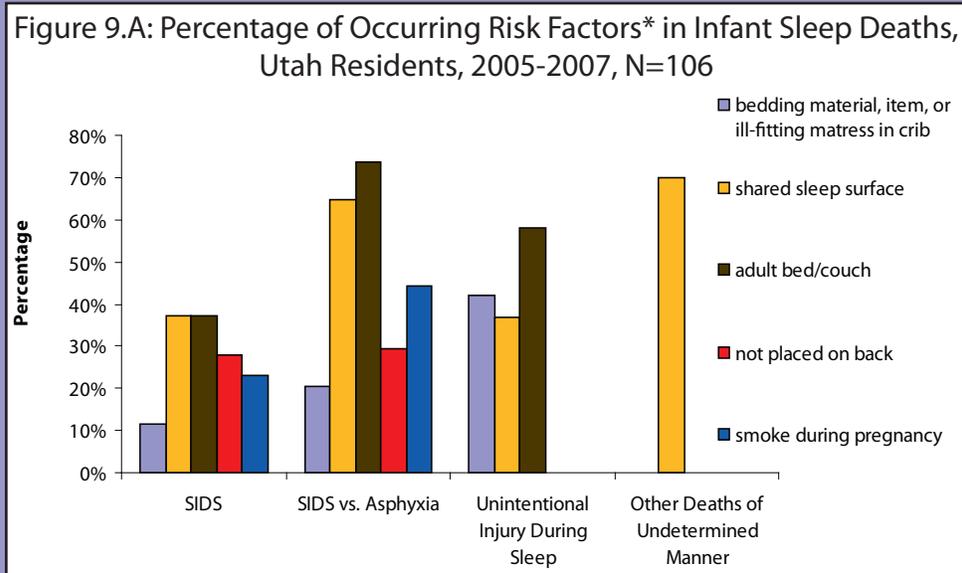
Table 9.A contains data for the leading cause of *infant* deaths in Utah from 2005-2007. Data for "Perinatal Conditions," "Congenital Malformations," and "Medical Conditions" come from IBIS (NCHS 130 selected causes of *infant* death).<sup>2</sup> Data for "Infant Sleep" and "Other Injuries" reflect cases in the Utah Child Fatality Database. *Infant* sleep deaths accounted for 13.4% of these total deaths and were a leading cause of death for Utah children in the first year of life.

| General Infant Cause of Death | Number of Infant Deaths (ages 364 days or less) | Number of Live Births | Infant Mortality Rate per 1,000 Infants by Major Causes (ages 364 days or less) |
|-------------------------------|---|-----------------------|---|
| Perinatal Conditions          | 325   | 160,055               | 2.03  |
| Congenital Malformations      | 234   | 160,055               | 1.46  |
| Infant Sleep                  | 106   | 160,055               | 0.66  |
| Medical Conditions            | 83  | 160,055               | 0.52  |
| Other Injuries                | 41  | 160,055               | 0.26  |

# 9. Infant Sleep Deaths

## Measured Risk Factors

Certain behaviors/risk factors have greater relevance in relation to one or more particular categories of *infant* sleep death than to another. For example, when it is obvious that an inappropriate object (a plastic bag, for example) is responsible for an *infant* death, whether or not the *infant* was placed on his or her back to sleep is no longer relevant information. Not all risk factors are tracked for all types of death. Only the most relevant risk factors to each category of death are shown in Figure 9.A.



\*Note that risk factors are not mutually exclusive and more than one risk factor may exist for a death.

## Adult Beds and Shared Sleep Surface

Two of the most frequent factors associated with *infant* sleep deaths are the practice of *co-sleeping* (sharing a sleep surface with another person) and the *infant* being put down to sleep on an adult bed.

*Co-sleeping* refers to the practice of the *infant* sharing a bed or other sleep surface or otherwise sleeping with another individual or individuals, be they adults or children. From 2005-2007, a total of 51 Utah *infants* died while sharing a sleep surface, either from *SIDS* (N=16), *SIDS vs. asphyxia* (N=22), unintentional (N=6), or undetermined (N=7) injury. Data included in this report include all possible cases of documented *co-sleeping* and include some cases of a parent falling asleep while holding and/or feeding an *infant*. *Co-sleeping* does not refer exclusively to an adult and *infant* sleeping in a bed at night.

## 9. Infant Sleep Deaths

The recommended practice is for the *infant* to share the same room as the parent/s but not the same sleep surface. A “co-sleeper” or bassinette next to the mother’s bed allows for frequent feeding.

Adult beds present several risks to *infants*. First, for the *infant* capable of rolling (or squirming), there is no rail to protect him/her from either falling off the mattress surface or from becoming wedged between the mattress and an adjacent wall or piece of furniture. Each year several Utah *infants* die from such mattress-wedge injuries, and although less common, fall injuries have resulted in suffocation deaths. A second risk with adult beds is that they often have softer coverings (e.g., pillowtop and memory foam). Young *infants* may have difficulty moving to get sufficient air should they be on their stomachs. Third, an *infant* can become covered by a pillow or tangled in covers.

### Bedding Material/Item in Crib/Ill-fitting Mattress

The American Academy of Pediatrics (AAP) recommends a crib with a well-fitting mattress with a fitted sheet. Other than the baby, nothing else should be in the crib. A blanket sleeper of appropriate weight is to be used rather than having any cover in the crib. Each year, several Utah *infants* die from unintentional injury due to inappropriate objects, bedding materials, pillows, or stuffed animals being in the crib. Additionally, *infants* occasionally die as the result of their head becoming wedged between an ill-fitting mattress and the crib rails.

### Placed on Back

Since 1994, the National Institute of Child Health and Human Development and the AAP have recommended that all healthy babies be placed on their backs to sleep in order to prevent *SIDS*. Since then, *SIDS* rates have declined by more than 50%.<sup>3</sup>

Nationally, it is recommended that cases where *SIDS* is a likely cause of death receive scene investigations where the caretakers are asked about the position in which *infants* were placed when they were put down to sleep. Caretakers are also asked about the position in which *infants* were discovered.<sup>3</sup>

### Smoking During Pregnancy

Nicotine is thought to impact the development of areas of the brain that regulate breathing. Nationally, *infants* born to mothers who smoked during pregnancy were found to be at 2-5 times greater risk for *SIDS* than babies whose mothers did not smoke during pregnancy.<sup>4</sup> Utah data show that babies born to mothers who smoked were three times more likely to die of *SIDS* and nine times more likely to die of *SIDS vs. Asphyxia* than babies who died from other causes and were born to mothers who did not smoke during pregnancy.

Maternal smoking data were obtained from Utah birth certificates for all *SIDS* and *SIDS vs. Asphyxia* cases where the *infant* was born in the state. Scene investigation was not uniform in the collection of smoke exposure data for these cases, so exposure to secondhand smoke could not be analyzed.

## 9. Infant Sleep Deaths

### References

- 1 The *infant* was put down to sleep or was left alone (presumably to sleep) and not checked on for an extended period of time.
- 2 Heron MP. Deaths: Leading cause of death for 2004. National vital statistics reports; vol 56 no 5. Hyattsville, MD: National Center for Health Data and Statistics. 2007.
- 3 SIDS Rate Source: CDC, National Center for Health Statistics, Sleep Position Data: NICHD, National Infant Sleep Position Study.
- 4 Sawnani, H; Olsen, E; Simakajorboon, N; "The Effect of In Utero Cigarette Smoke Exposure on Development of Respiratory Control: A Review"; Pediatric Allergy, Immunology, and Pulmonology; Volume 23, Number 3, 2010.

# Recommendations

- Educate parents/caregivers on safe sleep environments for *infants*. The American Academy of Pediatrics recommends the following to reduce the risk of *Sudden Infant Death Syndrome (SIDS)*:
  - *Infants* should be put to sleep on a firm crib mattress with a fitted crib sheet, free of soft materials such as pillows, bumper pads, comforters, stuffed animals, etc. The crib mattress should fit tightly in the crib.
  - *Infants* should be placed on their back to sleep.
  - Parents/caregivers may want to consider giving their *infant* a pacifier at bedtime.
  - *Infants* should not bed share. The safest place for an *infant* to sleep is a separate but nearby crib/bassinet to provide easy access for the mother to get to the *infant*, especially for breastfeeding.
  - Parents/caregivers should avoid overheating *infants* by not over-bundling them for sleep.
  - Parents/caregivers should avoid leaving *infants* in car seats, bouncers, swings, etc. for long periods of time.
  - Parents should educate everyone caring for their children on safe sleeping practices.
- Educate parents/caregivers about the increased risk of *SIDS* for mothers who smoke during pregnancy and for *infants* who are exposed to secondhand smoke.
- Partner with the Utah Department of Health Tobacco Prevention and Control Program to increase education to pregnant women and parents/caregivers with *infants* about the dangers of secondhand smoke.
- Increase data collection to determine why parents/caregivers are *co-sleeping* with *infants*.
- Conduct a survey of pediatricians and general practitioners to determine what, if any, information they give parents/caregivers on safe sleep. Develop educational materials on best practices for safe sleep for physicians to distribute to patients.

# Deaths from Sudden Infant Death Syndrome (SIDS)



*A six-week-old boy fell asleep on his stomach with his head turned to the side on his father's chest. The father fell asleep holding the infant and when he awoke, found his son to be unresponsive. No anomalies, disease, or identified injuries were found on the baby.*

## 9a. Deaths from Sudden Infant Death Syndrome (SIDS)

### Key Findings

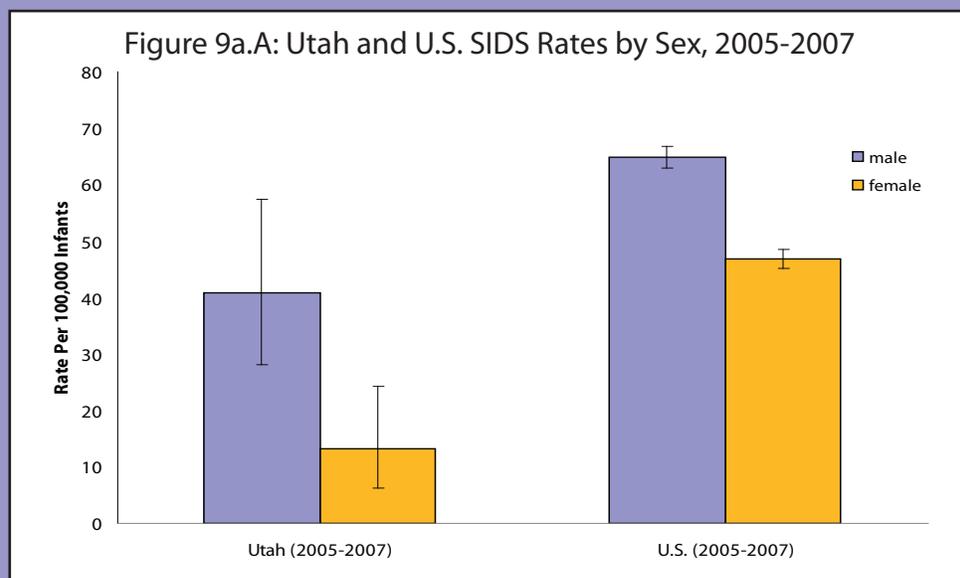
- Male *infants* are at greater risk for *SIDS* than female *infants*.
- Nearly two-thirds of the *infants* who died of *SIDS* were sleeping in a bed type inconsistent with recommendations made by the American Academy of Pediatrics.
- *Infants* born to mothers who smoked were three times more likely to die from *SIDS* than *infants* born to mothers who did not smoke.

*Sudden Infant Death Syndrome (SIDS)* is the sudden death of an *infant* under age one which remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history<sup>1</sup>.

From 2005-2007, there were 43 *SIDS* deaths in Utah for a rate of 27.4 deaths per 100,000 *infant* population<sup>2</sup>.

### Utah vs. U.S.

There is a *significant difference* between male and female *SIDS* death rates at both the Utah and U.S. levels. Utah *SIDS* death rates for 2005-2007 were significantly lower for both male and female *infants* than the U.S. rate. For 2005-2007, the Utah *SIDS* death rate for males was 40.8 deaths per 100,000 *infant* population and 13.2 deaths per 100,000 *infant* population for females. The U.S. *SIDS* death rate for males was 64.9 per 100,000 *infant* population and 46.8 per 100,000 *infant* population for females (Figure 9a.A).



## 9a. Deaths from Sudden Infant Death Syndrome (SIDS)

### Race and Ethnicity

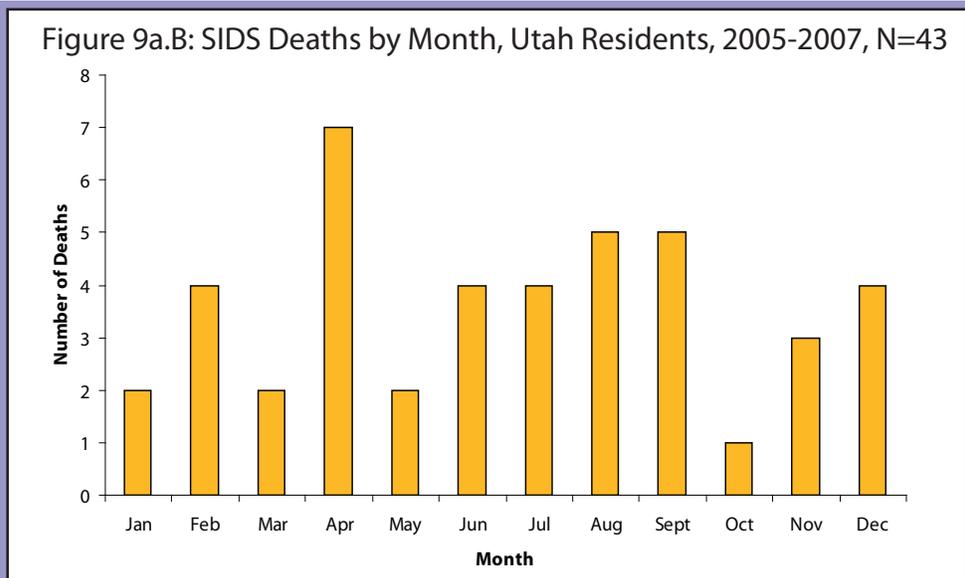
There was no statistically *significant difference* in the rate of *SIDS* deaths between *white non-Hispanic infants* and *Hispanic infants*. The *SIDS* death rate was 27.1 per 100,000 *white non-Hispanic infants* and 26.1 per 100,000 *Hispanic infants*<sup>3</sup>. While there were too few non-white/*non-Hispanic infants* to analyze as a separate category, national research indicates that African American *infants* are more than two times as likely to die of *SIDS* as white *infants* and that American Indian *infants* are nearly three times as likely to die of *SIDS* as white *infants*<sup>4</sup>.

### Urban, Rural, and Frontier Residence

There were no statistically significant *urban*<sup>5</sup>, *rural*<sup>6</sup>, or *frontier*<sup>7</sup> differences<sup>8</sup> for *SIDS* deaths based upon the county of residence of the decedent. The *urban SIDS* rate was 26.6 deaths per 100,000 *infant* population and the *rural/frontier SIDS* rate was 35.2 deaths per 100,000 *infant* population.

### Death by Month

According to the National Institute of Child Health and Human Development<sup>9</sup>, *SIDS* is more prevalent during winter months. It is hypothesized that the use of extra layers of blankets or clothing may be responsible. However, Utah data were not supportive of this finding. *SIDS* appeared to be evenly distributed across the seasons for the years 2005-2007 (Figure 9a.B).

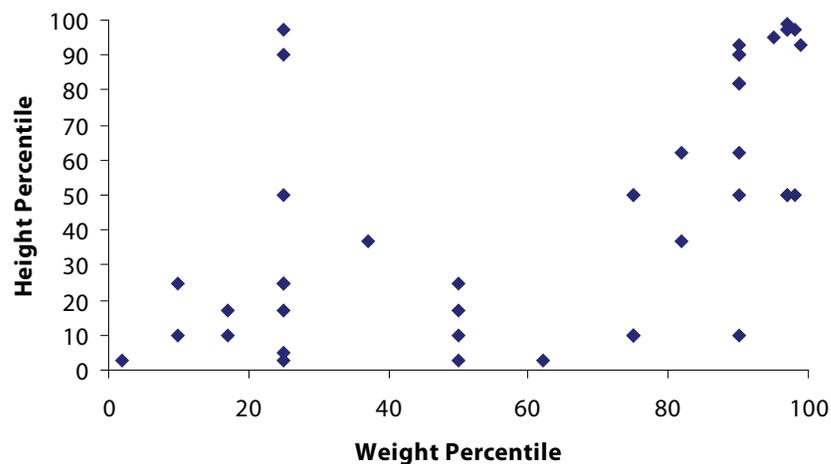


## 9a. Deaths from Sudden Infant Death Syndrome (SIDS)

### Height and Weight Percentiles

Nineteen *infants* who died from *SIDS* (44.2%) were at the 50<sup>th</sup> percentile or greater for both height and weight at the time of death. Eight *infants* (18.6%) had one category, height or weight, greater than the 50<sup>th</sup> percentile, while the other category was lower than the 50<sup>th</sup> percentile. The remaining 16 *infants* (37.2%) were at the 50<sup>th</sup> percentile or lower for both height and weight at the time of death (Figure 9a.C).

Figure 9a.C: Height and Weight Percentiles for SIDS Decedents, Utah Residents, 2005-2007, N=43

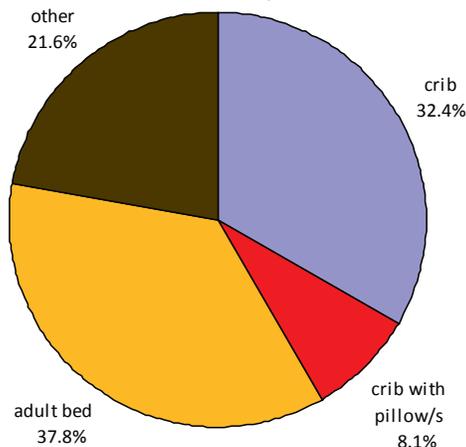


### Bed Type

Bed type data were available for 37 of the 43 *SIDS* cases. The American Academy of Pediatrics (AAP) recommends using a firm crib mattress with a fitted crib sheet to reduce the risk of *SIDS*. Nearly two-thirds (67.6%) of Utah *infants* who died from *SIDS* were found to have been sleeping in a bed type not recommended by the AAP. These included an adult bed or other sleep setting such as a playpen, couch, recliner (while being held), and an adult mattress (including inflatable mattresses) on the floor (Figure 9a.D).

## 9a. Deaths from Sudden Infant Death Syndrome (SIDS)

Figure 9a.D: Bed Type of Reported SIDS Decedents, Utah Residents, 2005-2007, N=37



### Co-sleeping/Shared Sleep Surface

*Co-sleeping* refers to the practice of the *infant* sharing a bed or other sleep surface or otherwise sleeping with another individual or individuals, be they adults or children. *Co-sleeping* does not refer exclusively to an adult and *infant* sleeping in a bed at night. Data included in this report include cases of documented *co-sleeping* and some cases of a parent falling asleep while holding and/or feeding the *infant*.

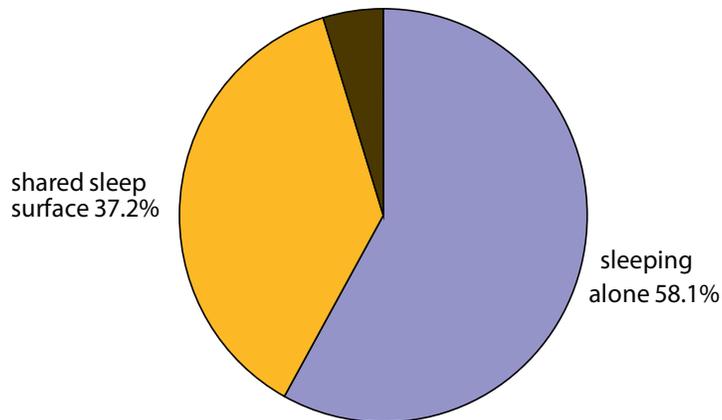
Sharing a sleep surface is a *SIDS* risk factor for *infants*<sup>10</sup> and especially for those whose mothers smoke (or who smoked during pregnancy)<sup>11</sup>. Sharing a sleep surface with a sibling also increases the risk for *SIDS*<sup>12, 13</sup>.

Researchers have been unable to identify any group of *infants* or parents for whom sharing a sleep surface has reduced the risk of *SIDS*<sup>14</sup>. Studies indicate that the risk of *SIDS* is halved when *infants* sleep in the same room as the caregiver/s but not in the same bed<sup>15</sup>. In Utah, 16 (37.2%) of the 43 deaths in 2005-2007 involved a shared sleep surface. Twenty-five decedents (58.1%) were known to have been sleeping alone and two (4.7%) had an unknown sleep status (Figure 9a.E).

Studies show that *infants* under 12 weeks of age are at greater risk for *SIDS* while sharing a sleep surface than are *infants* older than 12 weeks<sup>16, 17</sup>. In Utah, 68.8% (N=11) of the *SIDS* decedents who shared a sleep surface were under 12 weeks of age.

## 9a. Deaths from Sudden Infant Death Syndrome (SIDS)

Figure 9a.E: Co-sleeping Status of SIDS Decedents, Utah Residents, 2005-2007, N=43  
unknown 4.7%



### Smoking

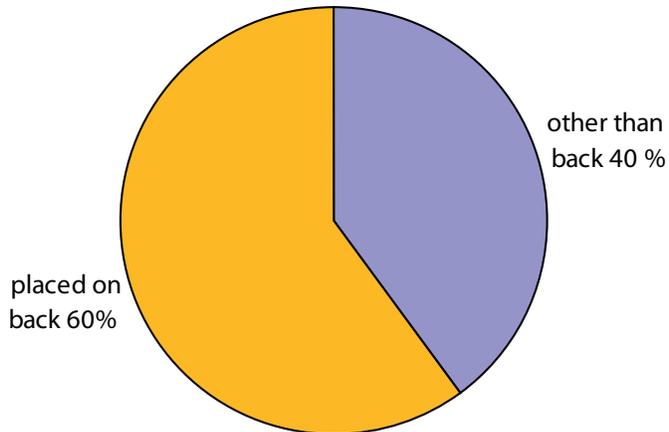
Of the 40 decedents with Utah birth certificates, 10 (25%) had a mother who smoked during pregnancy. When compared to *infants* who died from other causes, *infants* born to mothers who smoked were three times ( $OR=3$ ,  $CI= 1.4-6.5$ ) more likely to die from *SIDS* than *infants* born to mothers who did not smoke. Note that not all resident decedents were born in Utah and thus did not have a Utah birth certificate.

### Body Position

Whether or not the *infant* was placed on his or her back to sleep was known for 30 of the 43 *SIDS* decedents. Putting babies to sleep on their backs reduces the risk of *SIDS* by 40%<sup>18</sup>. Among the 30 cases where sleep position was known, 18 *infants* (60%) were placed on their backs to sleep (Figure 9a.F). Of the 18 *infants* placed on their backs, records indicated that 38.9% (N=7) were found unresponsive in this same position while 27.8% (N=5) were found on their stomachs or sides. Data for position found were missing for the remaining 33.3% (N=6) of decedents who were placed on their backs to sleep.

## 9a. Deaths from Sudden Infant Death Syndrome (SIDS)

Figure 9a.F: Sleep Position of Reported SIDS Decedents, Utah Residents, 2005-2007, N=30



For the 12 cases (40%) where the *infant* was not placed to sleep on his/her back, there were often specific reasons for not doing so. Scene investigator reports indicated that some decedents had been placed on their stomachs due to acid reflux or frequent vomiting. Fifty percent of these babies were found either on their stomach or side, while data for position found were missing for the remaining 50% of decedents who were placed other than on their backs to sleep.

# 9a. Deaths from Sudden Infant Death Syndrome (SIDS)

## References

- 1 Willinger, M., James, L.S., and Catz, C. "Defining Sudden Infant Death Syndrome (SIDS): Deliberations of an Expert Panel Convened by the National Institute of Child Health and Human Development. "Pediatric Pathology" 11:677-684, 1991.
- 2 *Infant* population is the total population under one year of age.
- 3 There were too few non-white/*non-Hispanic infants* to analyze as a separate category.
- 4 "Safe Sleep for Your Baby: Ten Ways to Reduce the Risk of Sudden Infant Death Syndrome (SIDS)", Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health, September 15, 2006.
- 5 *Urban* counties contain 100 or more persons per square mile. *Urban* counties include: Davis, Salt Lake, Utah, and Weber.
- 6 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.
- 7 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.
- 8 By location of residence.
- 9 NIH NEWS, National Institutes of Health, "NICHD Alerts Parents to Winter SIDS Risk and Updated AAP Recommendations"; January 18, 2006.
- 10 E.A. Mitchell, "Recommendations for sudden infant death syndrome prevention: a discussion document"; Archives of Disease in Childhood. February 2007; 92(2):155-159.
- 11 T. Horsley, T. Clifford, N. Barrowman, et al., "Benefits and harms associated with the practice of bed sharing: a systematic review"; Archives of Pediatric Medicine. 2007; 161:237-245.
- 12 R. Scragg, B.J. Taylor, et al., "Bed sharing, smoking and alcohol in the sudden infant death syndrome: results from the New Zealand cot death study"; British Medical Journal. 1993; 307:1312-1318.
- 13 F.R. Hauck, S.M. Herman, M. Donovan, et al., "Sleep environment and the risk of sudden infant death syndrome in an urban population: the Chicago Infant Mortality Study"; Pediatrics. 2003; 111:1207-1214.
- 14 E.A. Mitchell, "Editorial: Sudden Infant Death Syndrome: Should Bed Sharing Be Discouraged? "; Archives of Pediatric Medicine. 2007; 161:305-306.
- 15 E.A. Mitchell, "Recommendations for sudden infant death syndrome prevention: a discussion document"; Archives of Disease in Childhood. February 2007. 92(2):155-159.
- 16 P.S. Bair, P.J. Flemming, I.J. Smith, et al., "Babies sleeping with parents; case-control study of factors influencing the risk of sudden infant death syndrome"; British Medical Journal. 1999; 319:1457-1461.
- 17 C. McGarvey, M. McDonnell, A. Chong, M. O'Regan, T. Matthews, "Factors relating to the infant's last sleep environment in sudden infant death syndrome in the Republic of Ireland"; Archives of Disease in Childhood. 2003; 88:1058-1064.
- 18 "Exercise: SIDS Facts" Reducing the Risks in Child Care Speaker's Kit; 2008. HCCA Back to Sleep Campaign, American Academy of Pediatrics.

# SIDS vs. Asphyxia Deaths



*A two-month-old girl was put down to sleep with her mother in her parents' bed. A few hours later, she was found unresponsive.*

## 9b. SIDS vs. Asphyxia Deaths

### Key Findings

- *Hispanic infants* had a significantly higher rate of death classified as *SIDS vs. Asphyxia*.
- Nearly 65% of *infants* whose deaths were classified as *SIDS vs. Asphyxia* had been sharing a sleep surface with another person.
- *Infants* born to mothers who smoked were nine times more likely to die from *SIDS vs. Asphyxia* than *infants* born to mothers who did not smoke during pregnancy.

Sometimes circumstances are such that the medical examiner can narrow the source of an *infant* (under age one) death down to two causes—*Sudden Infant Death Syndrome (SIDS)* or *asphyxia*—but there is insufficient evidence to determine which was the true cause of death. In these cases, the cause of death on the death certificate reads “undetermined (*SIDS vs. Asphyxia*).” Asphyxiation can be caused by the position of the infant’s body preventing him/her from breathing adequately. Blankets, pillows, and stuffed toy animals in the sleep environment can be contributing factors. It is noted that *asphyxia* deaths can leave no findings during an autopsy to indicate that death by *asphyxia* has taken place. *Co-sleeping* (sharing a sleep surface with another person) was often present in *SIDS vs. Asphyxia* deaths.

Overall, from 2005-2007, there were 34 *SIDS vs. Asphyxia* deaths in Utah for a rate of 21.7 deaths per 100,000 *infant* population<sup>1</sup>.

### Sex

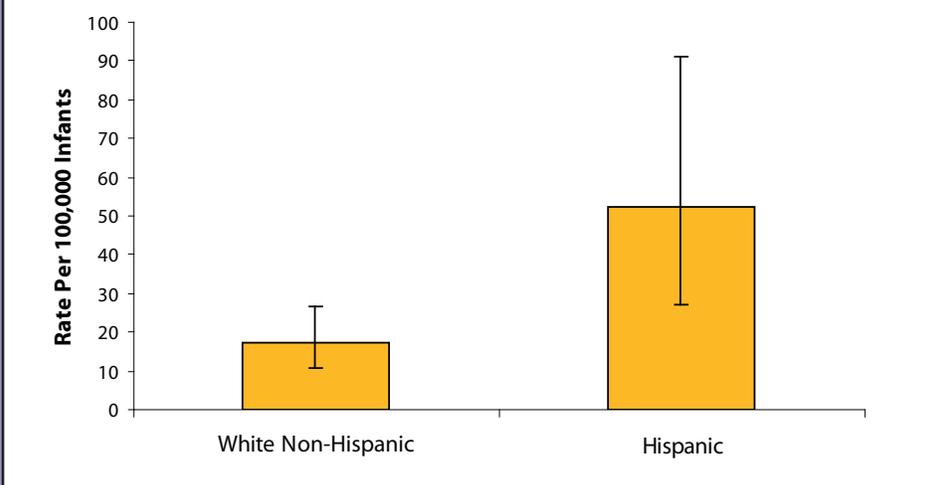
There was no *significant difference* by sex for *SIDS vs. Asphyxia* decedents. The male death rate was 24.7 per 100,000 *infants*, while the female death rate was 18.4 per 100,000 *infants*.

### Race and Ethnicity

From 2005-2007 there was a statistically *significant difference* between *white non-Hispanic* and *Hispanic SIDS vs. Asphyxia infant* death rates. The *SIDS vs. Asphyxia infant* death rate was 17.5 per 100,000 *infants* for *white non-Hispanics* and 52.3 per 100,000 *infants* for *Hispanics* (Figure 9b.A).

## 9b. SIDS vs. Asphyxia Deaths

Figure 9b.A: SIDS vs. Asphyxia Deaths by Race/Ethnicity, Utah Residents, 2005-2007, N=34



### Urban, Rural, and Frontier Residence

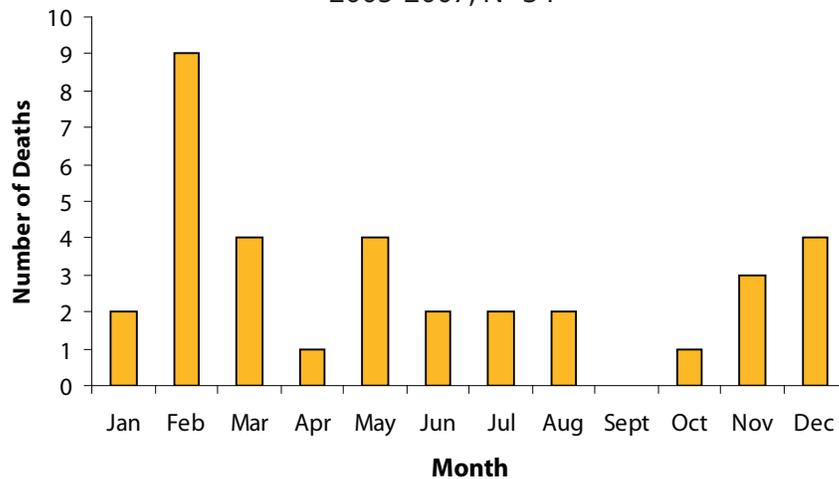
There were no statistically significant *urban*<sup>2</sup>, *rural*<sup>3</sup>, or *frontier*<sup>4</sup> differences<sup>5</sup> for *SIDS vs. Asphyxia* deaths based upon the county of residence of the decedent. The *urban SIDS vs. Asphyxia* rate was 19.9 deaths per 100,000 *infant* population and the *rural/frontier SIDS vs. Asphyxia* rate was 26.6 deaths per 100,000 *infant* population.

### Death by Month

February (N=9), March (N=4), May (N=4), and December (N=4) were the months with the most *SIDS vs. Asphyxia* deaths, while September (N=0), October (N=1), and April (N=1) were the months with the fewest *SIDS vs. Asphyxia* deaths (Figure 9b.B).

## 9b. SIDS vs. Asphyxia Deaths

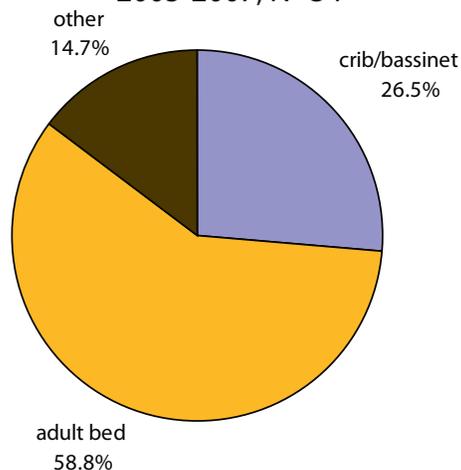
Figure 9b.B: SIDS vs. Asphyxia Deaths by Month, Utah Residents, 2005-2007, N=34



### Bed Type

Adult beds were the sleep environment for 20 (58.8%) of the *SIDS vs. Asphyxia* decedents, while nine (26.5%) were placed to sleep in cribs. Other sleep environments included settings such as couches and adult mattresses placed on the floor (Figure 9b.C).

Figure 9b.C: Bed Type of SIDS vs. Asphyxia Decedents, Utah Residents, 2005-2007, N=34

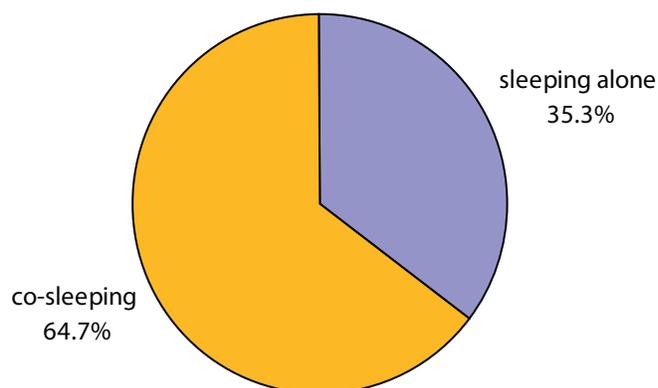


## 9b. SIDS vs. Asphyxia Deaths

### Co-sleeping

Of the *infants* whose deaths were identified as *SIDS vs. Asphyxia*, 22 (64.7%) had been *co-sleeping* with parents, other adult family members, or siblings. The remaining 12 (35.3%) decedents had been sleeping alone (Figure 9b.D). Most (18 of the 22 or 81.8%) of the *infant* decedents who had been *co-sleeping* were under 12 weeks of age. Research shows that *infants* under 12 weeks of age are at greater risk for *SIDS* while *co-sleeping* than are *infants* older than 12 weeks<sup>6,7</sup>.

Figure 9b.D: Co-sleeping Status of SIDS vs. Asphyxia Decedents, Utah Residents, 2005-2007, N=34

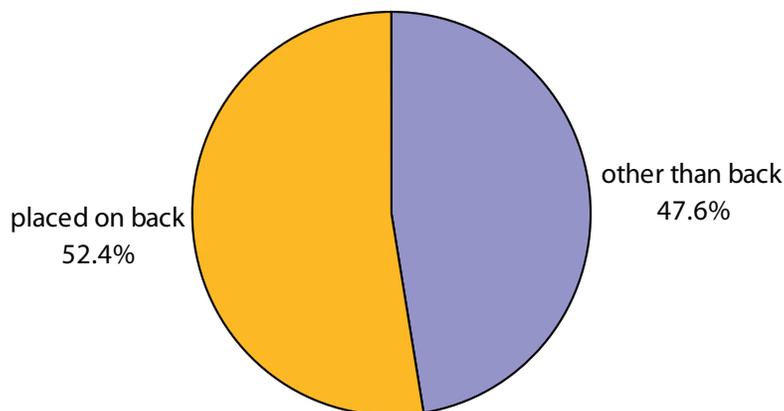


### Body Position

Among the 21 cases where sleep position was known, 11 *infants* (52.4%) were placed on their backs to sleep and 10 *infants* (47.6%) were not placed on their backs to sleep (Figure 9b.E).

## 9b. SIDS vs. Asphyxia Deaths

Figure 9b.E: Sleep Position of Reported SIDS vs. Asphyxia Decedents, Utah Residents, 2005-2007, N=21



### Smoking

Of the 32 decedents with Utah birth certificates, 15 (46.9%) had a mother who smoked during pregnancy. When compared to *infants* who died from other causes, *infants* born to Utah mothers who smoked were nine times ( $OR=9.2$ ,  $CI= 4.3-19.6$ ) more likely to die from *SIDS vs. Asphyxia* than *infants* born to Utah mothers who did not smoke<sup>8</sup>. Note that not all resident decedents were born in Utah and thus did not have a Utah birth certificate.

### References

1 *Infant* population is the total population under one year of age.

2 *Urban* counties contain 100 or more persons per square mile. *Urban* counties include: Davis, Salt Lake, Utah, and Weber.

3 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.

4 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.

5 By location of residence.

6 P.S. Bair, P.J. Flemming, I.J. Smith, et al., "Babies sleeping with parents; case-control study of factors influencing the risk of sudden infant death syndrome", *British Medical Journal*. 1999; 319:1457-1461.

7 C. McGarvey, M. McDonnell, A. Chong, M. O'Regan, T. Matthews, "Factors relating to the infant's last sleep environment in sudden infant death syndrome in the Republic of Ireland"; *Archives of Disease in Childhood*. 2003; 88:1058-1064.

8 Utah Vital Records Birth Data, 2005-2007 and Office of the Medical Examiner scene investigation files.

# Unintentional Injury Deaths During Sleep



*A five-month-old infant was put to sleep on a soft, adult-sized mattress. In the morning the baby was found covered by a blanket lying face-down on the bed.*

## 9c. Unintentional Injury Deaths During Sleep

### Key Findings

- Unintentional suffocation while in a sleep environment was the leading cause of injury death for *infants* in Utah.

From 2005-2007, 17 Utah *infants* under age one died as the result of injuries while they were sleeping or while they were in an intended sleep environment. This is a rate of 10.8 deaths per 100,000 *infants*. In each of these cases, the medical examiner determined the babies died from asphyxiation or suffocation. Two Utah one-year-olds also died of unintentional injuries while in a sleep environment (see Section 4: Other Unintentional Injury Deaths). Unintentional suffocation while in a sleep environment was a leading cause of injury death for *infants* in Utah.

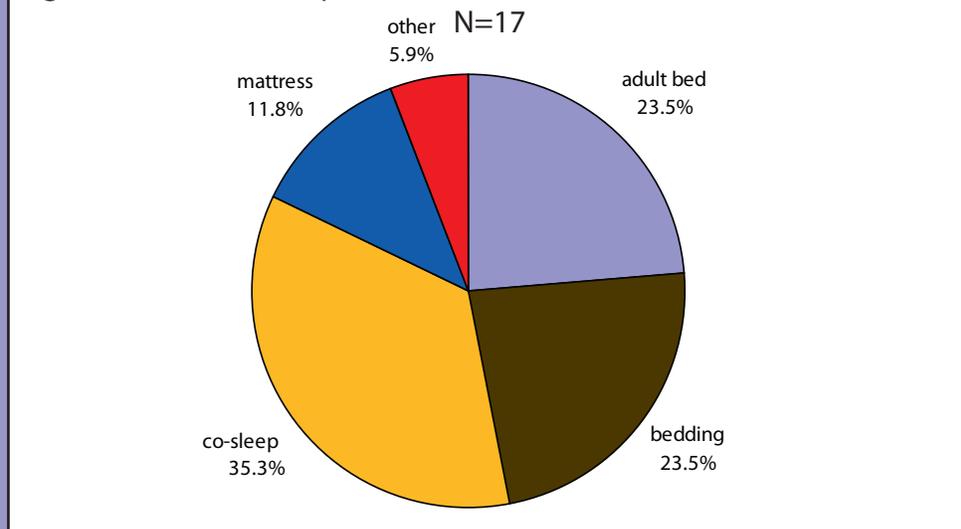
### Risk Factors

**Co-sleeping.** Of the *infants* whose sleep deaths were identified as unintentional injuries, 35.3% (N=6) had been *co-sleeping* (sharing a sleep surface) with one or both parents (Figure 9c.A). In several cases, it was the parent lying on top of the *infant* that caused the death.

**Adult bed.** Of the *infants* whose sleep deaths were identified as unintentional injuries, 23.5% had been put down to sleep on an adult bed and subsequently rolled off the bed and became wedged either between the mattress and a wall or between the mattress and a piece of furniture next to the bed (Figure 9c.A).

**Bedding.** Of the *infants* whose sleep deaths were identified as unintentional injuries, 23.5% had unnecessary bedding materials, including pillows, bumper pads, and blankets in their sleep environments (Figure 9c.A). Soft objects such as pillows, quilts,

Figure 9c.A: Infant Sleep Death Risk Factors, Utah Residents, 2005-2007,



## 9c. Unintentional Injury Deaths During Sleep

comforters, sheepskins, stuffed toys, and loose bedding should be kept out of the crib. A blanket sleeper of a weight appropriate for the room temperature, rather than a blanket, should be used. A firm crib mattress with a fitted crib sheet is the recommended sleeping surface<sup>1</sup>.

**Mattress.** Of the *infants* whose sleep deaths were identified as unintentional injuries, 11.8% died as the result of their heads becoming wedged between the crib mattress and the rails (Figure 13.A). It is important that the crib mattress fit tightly in the crib so as to prevent this type of injury.

**Other.** Of the *infants* whose sleep deaths were identified as unintentional injuries, 5.9% died from other unsafe materials being present in the sleep environment (Figure 13.A). Over the years, there have been *infant* sleep deaths resulting from items such as diaper bags, plastic bags, and strings being present in the crib or sleep environment. Additionally, there have been several cases of *infants* and one-year-olds dying after having been left for extended periods of time in car seats and “bouncy” chairs.

### Sex

There was no difference in rates between males and females among *infants* who died from unintentional sleep injuries. From 2005-2007, the unintentional *infant* sleep death rate was 12.4 per 100,000 *infants* (N=10) for males and 9.2 per 100,000 *infants* (N=7) for females.

### Race and Ethnicity

There was no statistically significant *race/ethnicity* difference for unintentional *infant* sleep deaths. The *white non-Hispanic* death rate was 9.6 per 100,000 *infants* (N=12) while the death rate for the category comparing all other races/ethnicities was 15.9 per 100,000 *infants* (N=5).

### Urban, Rural, and Frontier Residence

There was no significant *urban*<sup>2</sup>, *rural*<sup>3</sup>, or *frontier*<sup>4</sup> difference<sup>5</sup> for unintentional *infant* sleep deaths based upon the county of residence. The *urban* unintentional *infant* sleep death rate was 9.1 deaths per 100,000 *infants* (N=6) and the *rural/frontier* unintentional *infant* sleep death rate was 19.2 deaths per 100,000 *infants* (N=11). This was not a statistically *significant difference*.

## 9c. Unintentional Injury Deaths During Sleep

### References

1 American Academy of Pediatrics.

2 *Urban* counties contain 100 or more persons per square mile. *Urban* counties include: Davis, Salt Lake, Utah, and Weber.

3 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.

4 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.

5 By location of residence.

# Infant Sleep Deaths of Undetermined Manner



*An eight-week-old infant was found unresponsive after sleeping with her mother and father. Both parents had a known drug history. There were also several unexplained injuries to the baby upon autopsy. However, there was not enough evidence to determine the manner of death.*

## 9d. Infant Sleep Deaths of Undetermined Manner

### Key Findings

- Most of the *infant* sleep deaths of *undetermined manner* involved suspicious circumstances.

From 2005-2007, there were 10 Utah *infants* who died in a sleep environment but for whom a *manner of death* was not determined. Most of these *infants* died under suspicious circumstances such as a known drug use by the parent/s, the discovery of unexplained injuries upon autopsy, a history of child abuse by the parent/s, the previous death of a child in the home under the same circumstances, or inconsistent parental accounts of the events around the time of death.

Four of the *infants* died from asphyxiation under suspicious circumstances. Of these, three were sleeping with one or both parents at the time of death. An additional three *infants* died from undetermined causes. Of these, one was sleeping with a parent at the time of death and all three had suspicious circumstances surrounding their deaths. The remaining three *infants* who also died while sleeping with an adult, died either from an undetermined injury or from natural causes. Suspicious circumstances surrounded the deaths of two of these three *infants*.

# Poisoning Deaths of Undetermined Manner



*A 17-year-old male with a history of depression and substance abuse died at home from taking an overdose of prescription pain medication.*

# 10. Poisoning Deaths of Undetermined Manner

## Key Findings

- White teenagers living along the Wasatch Front made up the majority of the *poisoning deaths* of an undetermined manner.
- *Opiates* were the most common drug found in *adolescents* who died of poisonings of an undetermined manner.
- Seventy-three percent of decedents had a known *substance abuse* problem and 67% had a *history of treatment for mental illness*.

Poisonings are deaths due to ingestion (by a variety of means) of drugs, alcohol, chemicals, chemical vapors, other substances, or gases. This does not include the accidental exposure to chemicals or gases that may arise through mishaps at home, work, or elsewhere (e.g., carbon monoxide poisoning from a faulty furnace). Substances identified as contributing to the deaths of these particular *adolescents* were prescription drugs (most commonly *opiates*), illicit drugs (cocaine and heroin), both prescription and illicit drugs, both prescription drugs and alcohol, or both prescription drugs and over-the-counter medication. Because there was insufficient evidence to determine whether these deaths were accidental or intentional *overdoses*, the *manner of death* assigned on the death certificate is “undetermined.”

It is noted that this section includes 16 cases where the state of mind of the decedent at the time of drug ingestion was unknown. Decedents may or may not have intended to end their lives. In these cases, evidence was insufficient for the medical examiner to make a determination as to the *manner of death* and thus these cases are “manner undetermined.” An additional case of a *drug overdose* by a one-year-old is excluded from this section. Because the analyses of the cases in this section does not apply to the one-year-old decedent, that case is included in the “Other Deaths of Undetermined Manner” section.

Additional information about drug and other *poisoning deaths* can be found in Sections 1. *Homicides*, 2. *Suicides*, 4. Other Unintentional Injuries, and 11. Other *Deaths of Undetermined Manner*.

## Age

From 2005-2007, there were 16 Utah resident *adolescent poisoning deaths* of undetermined manner for an overall rate of 1.8 deaths per 100,000 population<sup>1</sup>. Decedents ranged in age from 12-18 years. The average age was 17.

## Sex

There was no significant sex difference for *adolescent poisoning deaths* of undetermined manner. The female death rate was 1.7 per 100,000 population while the male death rate was 2.0 per 100,000 population.

# 10. Poisoning Deaths of Undetermined Manner

## Race and Ethnicity

All of the Utah residents who died as the result of poisoning of undetermined manner from 2005-2007 were white. The number of *Hispanics* was fewer than five, and therefore, in accordance with UDOH policy, is unreportable.

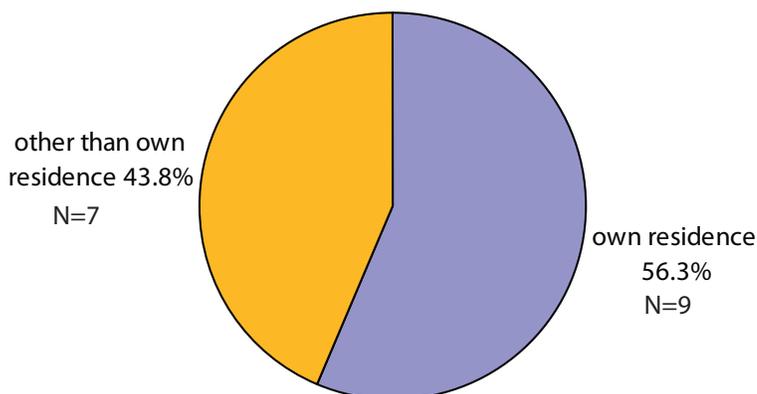
## Urban, Rural, and Frontier Residence

The majority of decedents were residents<sup>2</sup> of *urban*<sup>3</sup> counties. There were too few *rural*<sup>4</sup> and *frontier*<sup>5</sup> cases for comparison by county of residence. Fewer than five decedents were residents of *rural* or *frontier* counties.

## Incident Location

Nine (56.3%) of the poisoning of undetermined manner decedents who ingested a lethal substance died at their residence. Residence may have been a group home or foster home and, due to the age of the decedents, some may have been living on their own rather than in a parent's home (Figure 10.A). The location of the decedents when ingestion actually took place (vs. location of death) was not included in the data analysis.

Figure 10.A: Location of Incident for Poisoning of Undetermined Manner Decedents, Utah Residents, 2005-2007, N=16

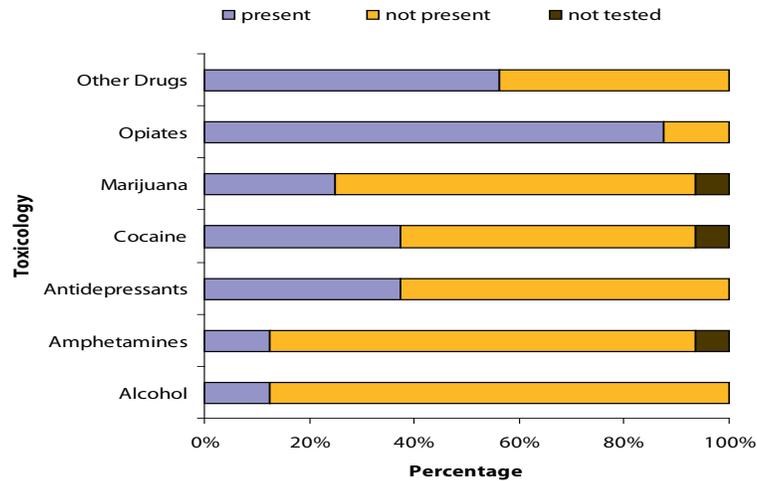


## Toxicology

Tests for alcohol, antidepressants, *opiates*, and *other drugs* were conducted for 100% of *adolescents* who died from poisoning of undetermined manner. Tests for *amphetamines*, cocaine, and marijuana were conducted for 93.8% of the decedents. The most common drug found in decedents was *opiates*. Alcohol and *amphetamines* were the least commonly found substances (Figure 10.B).

# 10. Poisoning Deaths of Undetermined Manner

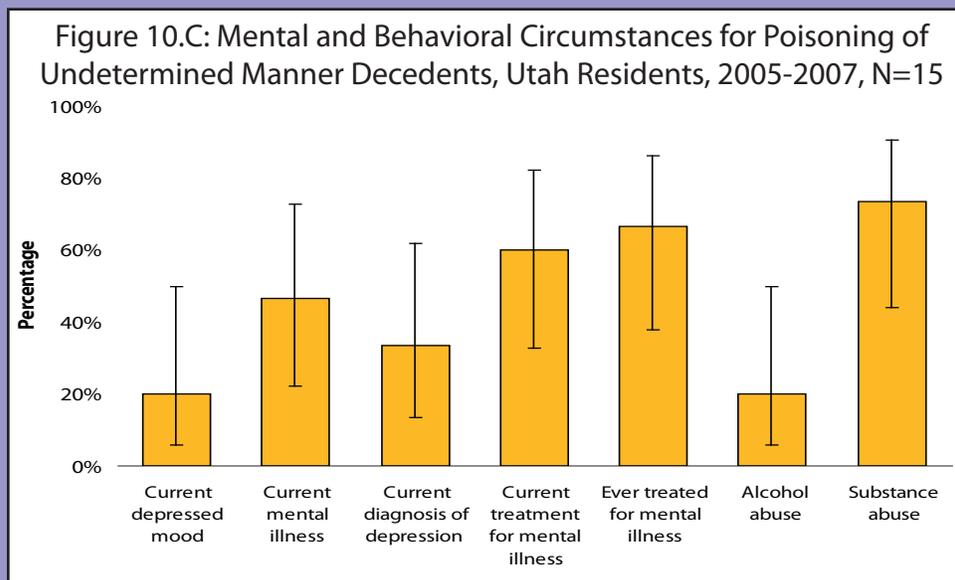
Figure 10.B: Toxicology Results for Poisoning of Undetermined Manner Decedents, Utah Residents, 2005-2007, N=16



## Mental Health Circumstances

Mental and behavioral circumstances were known for 93.8% of the decedents. Overall, *substance abuse* (73.3% of decedents), *history of treatment for mental illness*<sup>6</sup> (66.7%), and *current treatment for mental illness*<sup>7</sup> (60%) were the most common circumstances identified. *Alcohol abuse* and *current depressed mood*<sup>8</sup>, both identified for 20% of decedents, were the least common circumstances (Figure 10.C). Of the 16 decedents who died from poisoning of an undetermined manner, 12.5% (N=2) had none of these identified mental health circumstances.

## 10. Poisoning Deaths of Undetermined Manner



\*Note: categories are not mutually exclusive.

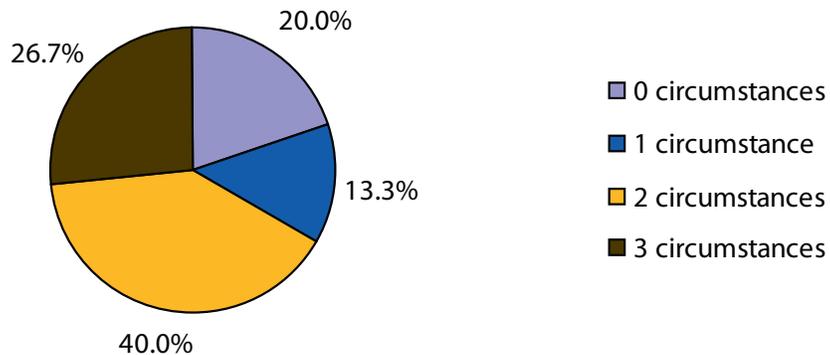
### Contextual Circumstances

*Contextual circumstances* were known for 93.8% (N=15) decedents. A variety of circumstances (e.g., *intimate partner problems*, the death of a family member or friend, a recent criminal/legal problem) were identified among poisoning of undetermined manner decedents, although three (20%) of these decedents had no contextual circumstances. Six (40%) of these decedents had two *contextual circumstances*, four (26.7%) had three *contextual circumstances*, and two (13.3%) had one circumstance (Figure 10.D).

The most frequently occurring circumstance was other relationship<sup>9</sup> problem, followed by death of a family member or friend, and physical health problem tied with recent criminal/legal problem.

# 10. Poisoning Deaths of Undetermined Manner

Figure 10.D: Number of Contextual Circumstances for Poisoning of Undetermined Manner Decedents, Utah Residents, 2005-2007, N=15



## References

1 Utah 2005-2007 population estimate of 12- to 18-year-olds, IBIS.

2 By location of residence.

3 *Urban* counties contain 100 or more persons per square mile. *Urban* counties include: Davis, Salt Lake, Utah, and Weber.

4 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.

5 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.

6 Indicates whether the decedent was noted as ever having received professional treatment for a mental illness, either at the time of death or in the past.

7 The decedent had a current prescription for a psychiatric medication or saw a mental health professional within the past two months. Treatment includes seeing a psychiatrist, psychologist, medical doctor, therapist, or other counselor for a mental health or *substance abuse* problem; attending anger management classes; or residing in an inpatient or halfway house or facility for *mental health problems*.

8 Identifies the decedent was observed to be *depressed* or had made statements as to being *depressed*. This is not a clinical diagnosis.

9 Friction between friends or family members, not a boyfriend/girlfriend or significant other.

# Recommendations

- Increase education among youth on the dangers of prescription drug abuse, especially with youth who have been treated for a mental illness or *substance abuse* problem.
- Increase education of parents and grandparents on the safe storage and disposal of prescription medications.
- Increase funding for the Utah Division of Substance Abuse and Mental Health to improve youth *substance abuse* treatment services and accessibility to treatment.
- Develop a statewide public awareness campaign on preventing *poisoning deaths*.
- Collaborate with the Prescription Drug Abuse Program at the Utah Department of Health to increase education among health care providers and prescribers.
- Increase education of faith-based groups and clergy on the incidence and dangers of prescription drug misuse.
- Increase awareness and publicity of the National Association of Mental Illness's program, "HOPE for Tomorrow," available at <http://www.namiut.org/find-local-support/free-education/hope-for-tomorrow>.
- Collaborate with programs within the Utah Department of Health that work with teenagers to adopt policies and provide education on teen drug use and misuse.
- Collaborate with the Utah Poison Control Center to link data to provide a more complete picture of *poisoning deaths* of undetermined manner in Utah.



## Other Deaths of Undetermined Manner



*A three-week-old infant was left with his mother's boyfriend while she went to work. The infant had been sick a few days before and was fussy. The boyfriend called the baby's mother and said he had found the baby unresponsive. There wasn't enough evidence to determine the manner of death.*

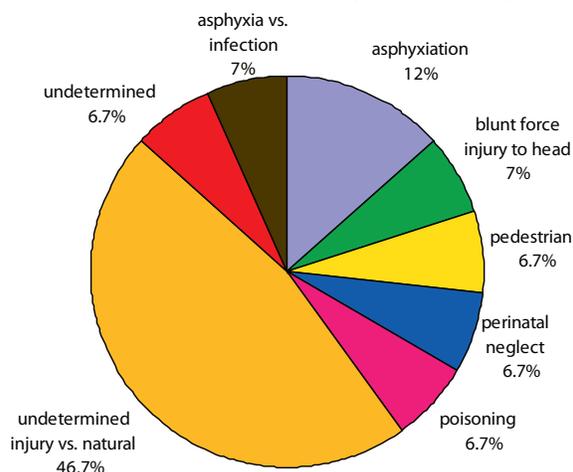
## 11. Other Deaths of Undetermined Manner

### Key Findings

- In the majority of *other deaths of undetermined manner*, no cause of death was evident.

From 2005-2007, there were 15 other<sup>1</sup> *deaths of undetermined manner* (excluding infant sleep-related deaths) among 0- to 18-year-olds, for a death rate of 0.59 per 100,000 population. Twelve of these deaths were among Utah residents and three among non-residents. For six of the cases, the injury cause of death was identified (Figure 11.A). These are suspicious cases where insufficient evidence exists to have made the determination that assault took place. For the remaining nine cases, neither the cause nor the *manner of death* could be identified. In one of these cases, no injury cause of death is evident. Sometimes, despite a complete autopsy, no explanation exists as to why someone has died. Additionally, the more time that elapses between death and autopsy, the more difficult it is to determine how an individual died. In one of the unknown cases, sufficient evidence was present that the death may have come about from *asphyxia* or from illness.

Figure 11.A: Cause of Other Deaths of Undetermined Manner, Utah Residents and Non-residents, 2005-2007, N=15



### Age

There were too few cases to conduct data analysis by age.

### Sex

There was no *significant difference* between males and females for other *deaths of undetermined manner*. The male death rate was 0.5 per 100,000 population (N=7) and the female death was 0.4 per 100,000 population (N=5).

# 11. Other Deaths of Undetermined Manner

## Race and Ethnicity

There were too few cases to conduct data analysis by *race* and *ethnicity*.

## Urban, Rural, and Frontier Residence

There were too few cases to conduct data analysis by location of *urban*<sup>2</sup>, *rural*<sup>3</sup>, or *frontier*<sup>4</sup> residence.

## References

1 "Other" excludes *adolescent* poisoning (ages 12-18) and infant sleep *deaths of undetermined manner*.

2 *Urban* counties contain 100 or more persons per square mile. *Urban* counties include: Davis, Salt Lake, Utah, and Weber.

3 *Rural* counties contain more than six but fewer than 100 persons per square mile. *Rural* counties include Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a *rural county*.

4 *Frontier* counties contain six or fewer persons per square mile. *Frontier* counties include Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a *frontier county*.

# Recommendations

Deaths of undetermined manner are defined as deaths where there is no evidence to indicate that one *manner of death* is more compelling than another *manner of death*. The medical examiner is unable to confirm, based on available evidence, whether the decedent died from a natural *manner of death* (e.g., *SIDS*), accidental *manner of death*, *homicide*, or *suicide*. Thus, no recommendations for prevention of these deaths were given by the Child Fatality Review Committee.

# Glossary of Terms

# Glossary of Terms

**Abuse Homicide:** four characteristics separate abuse homicides from other child homicides. These characteristics include: 1) a caregiver was the perpetrator; 2) the weapon involved was usually the hands of the perpetrator; 3) the abuse injuries tended to result in a less immediate death than non-abuse injuries (e.g., *gunshot* wounds, *immolation*)—that is, there was less certainty while injuries were being inflicted that death was imminent; and 4) the perpetrator suicides did not occur during the injury incidents.

**Adolescent:** decedents ages 12 through 18 years old.

**Alcohol Abuse:** self-admitted or observed by others to have an alcohol problem.

**Amphetamines:** central nervous system stimulant class drug. They can be illicit drugs such as methamphetamine or prescription drugs used to treat neurological or psychological disorders like Attention-Deficit/Hyperactivity Disorder (ADHD).

**Asphyxia:** death resulting from lack of oxygen. Includes smothering (the mechanical obstruction of the flow of air from the environment into the mouth and/or nostrils), strangulation (prevent breathing by compression of the trachea), hanging (strangulation caused by suspension by the neck), positional asphyxia (asphyxia that occurs when one's body position prevents them from breathing adequately), compressional asphyxia (the mechanical limitation of the expansion of the lungs by compressing the torso, hence interfering with breathing), or choking (block normal breathing by compressing or obstructing the trachea or by poisoning or adulterating available air).

**ATV:** all-terrain vehicle (includes snowmobiles)

**BAC:** Blood Alcohol Content (or Concentration). Expressed in terms of volume of alcohol per volume of blood in the body (PPM). Used as a measure of intoxication for legal or medical purposes.

**Cause of Death:** specific injury that started the downhill course of events that led to death.

**Child Abuse Homicide:** a childhood death resulting from maltreatment (either assault or neglect) by a responsible caretaker.

**Child Safety Seat (proper use of):** Utah state law requires that all children under age 8 ride in an appropriate car seat or booster seat that is used according to manufacturer directions. Children who are not yet 8 years old but are taller than 57 inches do not have to use a booster seat but must wear a properly adjusted seatbelt.

**CI:** A confidence interval (CI) is a range around a measurement that conveys how precise the measurement is.

# Glossary of Terms

**Contextual Circumstances:** circumstances in the life of the decedent that were taking place around the time of death that could have influenced the decedent's judgment or behavior.

**Co-sleeping:** sharing a bed or sleep surface with another person (usually a parent). Data included in this report include incidents where a parent fell asleep while holding and/or feeding their baby. Co-sleeping does not refer exclusively to an adult and infant sleeping in a bed at night.

**Crisis:** Acute precipitating events which appear to have contributed to the incident. These events can be two weeks before or after the incident.

**Current Depressed Mood:** identifies decedents who were observed to be depressed or had made statements as to being depressed. This is not a clinical diagnosis.

**Current Diagnosis of Depression:** the person has been "diagnosed" by a health care or mental health professional and is currently seeking treatment and/or taking medication for depression.

**Current Treatment for Mental Illness:** the decedent had a current prescription for a psychiatric medication or saw a mental health professional within the past two months. Treatment includes seeing a psychiatrist, psychologist, medical doctor, therapist, or other counselor for a mental health or substance abuse problem; attending anger management classes; or residing in an inpatient or halfway house facility for mental health problems.

**Death of Friend/Family:** the death of a friend or family member within the past five years.

**Death of Undetermined Manner:** a designation made by the medical examiner when insufficient evidence exists to determine the intent of the fatal injury. For example, often it cannot be determined in poisoning deaths whether the decedent intended to take his/her own life or whether the decedent simply accidentally overdosed. There are five possible manner designations the medical examiner may assign: natural, accidental, suicide, homicide, or undetermined. (See Undetermined Manner of Death)

**Depressed:** identifies decedents who were documented as having a depressed mood at the time of the injury. Allows for perception of others to be noted although the decedent may not have had a medical diagnosis of depression.

**Depression:** a type of mental illness diagnosis.

**Dextromethorphan:** common drug of abuse. A cough-suppressing ingredient found in over-the-counter cough medicines.

**Disabilities:** includes physical (e.g., cerebral palsy), developmental (e.g., Down Syndrome, autism), or sensory (blindness, hearing loss).

# Glossary of Terms

**Disclosed Intent:** the decedent had expressed suicidal feelings to another person. This code is used only if there was opportunity to intervene between the time the person disclosed intent and the injury event.

**Drowning:** asphyxia resulting from liquid entering the lungs and preventing the absorption of oxygen.

**Drug Overdose:** describes the ingestion or application of a drug or other substance in quantities greater than are recommended or generally practiced. An overdose is widely considered harmful and dangerous as it can result in death.

**Ethnicity:** refers to the decedent as being "Hispanic." The identification of Spanish heritage is the only nationally recognized ethnicity among Utah decedents. Next of kin indicate the decedent's ethnicity. (See Hispanic)

**Ever Treated for Mental Illness:** noted as having ever been treated for mental illness, whether by therapy or medication (See Current Treatment for Mental Illness).

**Financial Problem:** specific problems related to financial situations such as overwhelming debt or bankruptcy.

**Frontier County:** frontier counties contain six or fewer persons per square mile. Frontier counties included: Garfield, Wayne, Daggett, Kane, Piute, San Juan, Millard, Rich, Emery, Beaver, Grand, Juab, and Duchesne. In 2005, Uintah was also a frontier county.

**Frontier Residence:** residence in a frontier county. (See Frontier County)

**Gang-related:** specifically related to gang rivalry or gang activity as documented in a police report or by the medical examiner.

**GDL:** Graduated Driver License (GDL) is a group of laws allowing beginning drivers to build driving experience before they are exposed to higher-risk roadway situations.

**Gunshot (homicide):** decedent died as the result of being shot and the manner of death on the death certificate is homicide.

**Health Problem:** decedent was experiencing physical health problems (terminal disease, debilitating condition, chronic pain) that may have played a role in the suicide or homicide.

**Hispanic:** ethnicity of the decedent of Spanish culture or origin, regardless of race.

**History of Treatment for Mental Illness:** indicates whether the decedent was noted as ever having received professional treatment for a mental illness, either at the time of death or in the past (see Current Treatment for Mental Illness).

# Glossary of Terms

**Homicide:** death resulting from the intentional use of force or power, threatened or actual, against one person, group, or community.

**ICD-10:** ICD stands for International Classification of Diseases. It is a coding system maintained by the World Health Organization and the U.S. National Center for Health Statistics used to classify causes of death, injury, and disease. These codes are updated approximately every 10 years to account for advances in medical technology. The U.S. is currently using the 10th revision (ICD-10) to code causes of death.

**Infant:** a baby under one year of age.

**Injuries of Undetermined Manner:** injuries resulting from the use of force or power against oneself or another person for which the evidence indicating one manner of death is no more compelling than the evidence indicating another manner of death.

**Injuries Inflicted by Another Person:** refers to injury caused by the perpetrator for child abuse homicides in this report. Refers to injuries caused by hitting, punching, slapping, or shaking and injuries in which the perpetrator used his/her hands, fists, or feet to inflict.

**Intimate Partner Problem:** friction or conflict between current or former intimate partners.

**Immolation:** to kill by fire.

**Job Problem:** the decedent was experiencing problems at work which seemed to contribute to the event.

**Legal Intervention:** injury or poisoning caused by police or other legal authorities (including security guards) during law enforcement activities. Includes injuries and poisonings (mace, pepper spray) inflicted during legal action or execution, or while attempting to enforce the law such as arrest or restraint of arrested persons.

**Manner of Death:** classification of the circumstances surrounding death. In Utah, the manner of death is determined by the medical examiner. There are five categories of manner of death: natural, accidental, suicide, homicide, and undetermined.

**Median:** measure used instead of mean (average). The midpoint of the range of numbers that are arranged in order of value.

**Mental Health Problem:** indicates that there is supporting documentation that the decedent had a diagnosis of a disorder or syndrome listed in the DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, Fourth Revision), with the exception of alcohol and other substance abuse. Examples include: major depression, schizophrenia, generalized anxiety disorder, mental retardation, etc.

**Motor Vehicle:** refers to street-legal vehicles involved in traffic situations.

# Glossary of Terms

**Non-Hispanic:** persons not identifying as Hispanic.

**Opiates:** narcotic-type drugs such as codeine, morphine, hydrocodone, and heroin. Prescription opiates are usually used to treat pain but are also central nervous system suppressants.

**OR:** odds ratio (OR) is a way of comparing whether the probability of a certain event is the same for two groups. An odds ratio of 1 implies that the event is equally likely in both groups. An odds ratio greater than one implies that the event is more likely in the first group. An odds ratio less than one implies that the event is less likely in the first group.

**Other Drugs:** drugs not specifically classified by guidelines like antidepressants or opiates. These drugs can be prescription or over-the-counter.

**Other Causes of Homicide Death:** homicides not identified in this report as abuse homicides. Include peer homicides, firearm homicides, and homicides where the parent committed suicide immediately after killing his/her child/ren.

**Other Non-Hispanic:** person who is not Hispanic and has origins among any of the black racial groups of Africa, original peoples of the Far East, Southeast Asia, or the Indian subcontinent, original peoples of the Pacific Islands, or the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition, and persons who identify with more than one racial category.

**Other Relationship Problem:** friction or conflict between friends or family members.

**Other Undetermined Injury/Death:** death of an undetermined intent. Either there was insufficient evidence to have made the determination that assault took place, or despite complete autopsy no cause of death could be identified. Excludes SIDS vs. Asphyxia cases.

**Other Unintentional Injury/Death:** unintentional non-motor vehicle injury deaths excluding drowning and infant sleep deaths.

**Overdose:** the unsafe dosage of a drug or medication, which can result in death.

**Passenger:** person not operating vehicle, yet being transported by the vehicle. Includes exterior riders not using designed seating.

**Pedestrian:** includes pedal cyclists and children injured while in driveways.

**Perpetrator:** person who inflicts injury.

**Perpetrator of Intimate Partner Violence (IPV):** the decedent was the perpetrator of interpersonal violence during the past month or has had a restraining order filed against him or her within the past month.

# Glossary of Terms

**Physical Health Problem:** problems relevant to the event such as a terminal illness or conditions like chronic pain.

**Poisoning Death:** death due to ingestion (by a variety of means) of drugs, alcohol, chemicals, chemical vapors, other substances, or gases. This does not include the accidental exposure to chemicals or gases that may arise through mishaps at home, work, or elsewhere (e.g., carbon monoxide poisoning from faulty furnace).

**Race:** several categories, including: 'white', 'African American', and 'American Indian', based upon physical characteristics and usually identified on behalf of the decedent by the next of kin.

**Recent Death of a Friend/Family:** death (other than by suicide) of a family member or friend within the last five years that appears to have contributed to the suicide.

**Recent Legal/Criminal Problem:** at the time of the incident the decedent was facing a legal (civil) or criminal (recent or impending arrest, police pursuit, impending criminal court date, including military crimes) problem.

**Residential Treatment:** therapy-oriented, multi-week residential programs for "troubled youth." These programs include an academic component and often an outdoor component as well.

**Rural County:** rural counties contain more than six but fewer than 100 persons per square mile. Urban counties included Box Elder, Tooele, Sevier, Iron, Carbon, Morgan, Sanpete, Wasatch, Summit, Washington, and Cache. In 2006 and 2007, Uintah was also a rural county.

**Rural Residence:** residence in a rural county (See Rural County).

**Safety Seat (proper use of):** designation determined by scene investigators and recorded on crash report.

**School Problem:** at the time of the incident the decedent was experiencing a problem such as poor grades, bullying, social exclusion at school, or performance pressures.

**Seat Belt (proper use of):** designation determined by scene investigators and recorded on crash report.

**SIDS vs. Asphyxia:** cause of death listed on the death certificate when the medical examiner has insufficient evidence to determine which was the true cause of death.

**Significant Difference:** a finding that was statistically unlikely to have happened by chance.

**Substance Abuse:** self-admitted or observed by others to have a prescription drug problem or problem with any illicit drug except marijuana.

# Glossary of Terms

**Sudden Infant Death Syndrome (SIDS):** the sudden death of an infant under one year of age which remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history.

**Suicidal Intent:** decedent disclosed to another person the intention to commit suicide and there was time for intervention.

**Suicide:** death resulting from the intentional force or use of force against oneself; a preponderance of evidence should indicate that the use of force was intentional.

**Suicide Attempt:** decedent was known to have made previous suicide attempts, regardless of the severity of those attempts. Includes self-report and report or documentation from others including family, friends, and health professionals.

**Suicide Note:** a note left stating intent of injury. This can be in any form, from paper to text message.

**THC:** Tetrahydrocannabinol; a compound that is obtained from cannabis or is made synthetically; it is the primary intoxicant in marijuana and hashish.

**Toddlers:** children ages 1-2 years.

**Undetermined Cause of Death:** when a specific abnormality or etiology responsible for causing death cannot be determined or identified.

**Undetermined Intent:** see Undetermined Manner of Death.

**Undetermined Manner of Death:** death with evidence indicating that one manner of death is no more compelling than the evidence indicating another manner of death. (See Death of Undetermined Manner)

**Urban County:** urban counties contain 100 or more persons per square mile. Urban counties include Davis, Salt Lake, Utah, and Weber.

**Urban Residence:** residence in an urban county. (See Urban County)

**White Non-Hispanic:** person who is not Hispanic and has origins among any of the original peoples of Europe, North Africa, or the Middle East.

**Xanax:** brand name for the drug alprazolam. Used to treat anxiety and panic attacks.

# Appendix: Summary Table

The following table summarizes the number of child deaths in Utah from 2005-2007. During this timeframe, 1,377 Utah residents 18 years of age and younger died. Of those, 33.6% (N=463) were injury-related..

**Number of Deaths of Utah Children Ages 0-18, 2005-2007**

| <b>Cause of Death</b>                               | <b>UT Residents</b> | <b>Non-residents</b> | <b>Total # of Deaths</b> |
|---|---------------------|----------------------|--------------------------|
| Homicide  | 20                  | 0                    | 20                       |
| Abuse Homicide                                      | 17                  | 0                    | 17                       |
| Non-abuse Homicide                                  | 46                  | 2                    | 48                       |
| Suicide   | 34                  | 0                    | 34                       |
| Drowning Deaths                                     | 10                  | 0                    | 10                       |
| Drug Deaths   | 6                   | 0                    | 6                        |
| Choking Deaths                                      | 6                   | 0                    | 6                        |
| Residential Fire Deaths                             | 2                   | 0                    | 2                        |
| Furniture Deaths                                    | 7                   | 2                    | 9                        |
| Outdoor Recreation Deaths (excludes ATVs, drowning) | 2                   | 1                    | 3                        |
| "Stunt" Deaths                                      | 4                   | 0                    | 4                        |
| "Supervision" Deaths                                | 20                  | 1                    | 21                       |
| All Others  | 12                  | 1                    | 13                       |
| ATV Deaths  | 42                  | 1                    | 43                       |
| Motor Vehicle Driver Deaths                         | 65                  | 14                   | 79                       |
| Motor Vehicle Passenger Deaths                      | 34                  | 0                    | 34                       |
| Motor Vehicle Pedestrian Deaths                     | 2                   | 0                    | 2                        |
| Motor Vehicle Scooter Deaths*                       | 43                  | 0                    | 43                       |
| SIDS  | 34                  | 0                    | 34                       |
| SIDS vs. Asphyxia Deaths                            | 19                  | 0                    | 19                       |
| Unintentional Injuries During Sleep                 | 10                  | 0                    | 10                       |
| Infant Sleep Deaths of Undetermined Manner          | 16                  | 0                    | 16                       |
| Poisoning Deaths of Undetermined Manner             | 12                  | 3                    | 15                       |
| Other Deaths of Undetermined Manner                 |                     |                      |                          |
| <b>Total Injury-related** Deaths</b>                | <b>463</b>          | <b>25</b>            | <b>488</b>               |
| <b>Total Deaths</b>                                 | <b>1377</b>         | <b>25</b>            | <b>1402</b>              |
| Natural Deaths                                      | 914                 | 0                    | 914                      |
| Diseases/Medical                                    |                     |                      |                          |

\* Two scooter-related deaths were excluded from data analysis due to initial lack of information. \*\* Injury-related deaths include the following: homicide, suicide, drowning, other unintentional injuries, ATV, motor vehicle (driver, passenger, and pedestrian), SIDS, SIDS vs. Asphyxia, unintentional injuries during sleep, infant sleep deaths of undetermined manner, poisonings of undetermined manner, and other deaths of undetermined manner.

# Appendix: Data Sources

# Data Sources

This report uses data from multiple sources. Personal identifier variables allow for linkages across datasets so that as many details as possible could be collected for each case. The combined data are housed in the Utah Child Fatality Database, which is maintained by the Utah Department of Health (UDOH) Violence and Injury Prevention Program. The “backbone” of the Utah Child Fatality Database is the Utah Vital Records Database (death certificates) and data from the Medical Examiner System of Utah (MESU) database. In addition, for each child death, the medical examiner case file was abstracted for information not appearing in MESU. Other data sources may exist based on the type or cause of death.

Because data in this report come from a variety of different sources, frequencies reported here may or may not be consistent with that of other published sources. It is noted that deaths occurring on tribal reservations are not necessarily included in vital records data but may have been recorded elsewhere.

## ATV Deaths

All cases with an accidental *manner of death* were identified from the Utah Vital Records and MESU databases. From these, all cases coded as ‘*motor vehicle*’ were reviewed to identify *ATV* cases and then reconciled against crash reports (DI-9 forms).

## Drowning Deaths

*Drowning* cases were identified by reconciling the Utah Vital Records data with MESU data. Cases were defined as an accidental *manner of death*, as assigned by the medical examiner and MESU database, in addition to the text appearing in the death certificate underlying cause of death field/s. Location and circumstance information were obtained from medical examiner case files as well as from CFRC findings. National data came from CDC WONDER (Wide-ranging Online Data for Epidemiologic Research).

## Homicides

*Homicides* were identified by reconciling the Utah Vital Records data with MESU data. All cases with a *homicide manner of death* were included. The UT-VDRS provided information on *perpetrator* relationship to the victim. UT-VDRS narrative, injury description, and findings from the CFRC allowed for the identification of cases that involved abuse. National data came from CDC WONDER (Wide-ranging Online Data for Epidemiologic Research).

## Deaths from Sudden Infant Death Syndrome (SIDS)

*SIDS* cases were identified by reconciling the Utah Vital Records data with MESU data. Cases were defined as “natural *manner of death*,” as assigned by the medical examiner and appearing in the MESU database, in addition to the text appearing in the death certificate underlying cause of death field/s. Height and weight percentiles and sleep variables came from medical examiner case files. The prenatal smoking history variable came from birth certificates. National data came from CDC WONDER (Wide-ranging Online Data for Epidemiologic Research).

## SIDS vs. Asphyxia Deaths

*SIDS vs. Asphyxia* cases were defined as all cases where the decedent is under one

year of age, has an *undetermined manner of death*, and the medical examiner has written some variation of “*SIDS vs. Asphyxia*” as the underlying cause of death on the death certificate. Sleep variables came from medical examiner case files and prenatal smoking history came from birth certificates.

## Unintentional Injury Deaths During Sleep

To identify all *infant* deaths that were due to unintentional injuries during sleep or in a sleep setting, all cases involving decedents under one year of age with an accidental *manner of death* on the death certificate and in MESU were examined. Cause of death, as determined by reviewing the medical examiner-assigned underlying cause of death, and information regarding whether or not the *infant* was in a sleep environment, determined if the case was an “unintentional injury during sleep” case. Utah Vital Records data were then reconciled against MESU data. Sleep variables came from medical examiner case files. Findings from the CFRC contributed when available.

## Motor Vehicle Driver and Passenger Deaths

*Motor vehicle*-related deaths were identified by reconciling data from the Utah Vital Records database, MESU, the Utah Department of Public Safety, Fatality Analysis Reporting System (FARS), and a log of media accounts of crashes. To qualify as a case, at least two positive identifiers had to exist in at least two data sources. Drug and alcohol use, driver-related factors, and safety restraint use came from FARS. National data came from CDC WONDER (Wide-ranging Online Data for Epidemiologic Research).

## Motor Vehicle Pedestrian Deaths

*Pedestrian* deaths were identified by reconciling data from the Utah Vital Records database, MESU, the Utah Department of Public Safety, Fatality Analysis Reporting System (FARS), and a log of media accounts of crashes. Findings from the CFRC contributed when available. National data came from CDC WONDER (Wide-ranging Online Data for Epidemiologic Research).

## Other Deaths of Undetermined Manner

From the Utah Vital Records and MESU databases, all cases with an *undetermined manner of death* were identified. The cases that were neither “*SIDS vs. Asphyxia*” nor “undetermined *adolescent* poisoning” make up the “*other undetermined death*” category.

## Other Unintentional Injury Deaths

From the Utah Vital Records and MESU databases, all cases with an accidental *manner of death* were identified. The cases that were neither “*drowning*” nor “unintentional *infant* sleep deaths” make up the “other unintentional deaths” category. Further categories were devised based upon the underlying cause of death as assigned by the medical examiner on the death certificate. Findings from the CFRC contributed when available.

# Data Sources

## Poisoning Deaths of Undetermined Manner

*Poisoning deaths* of undetermined manner were identified by reconciling the Utah Vital Records data with MESU data. All cases with an *undetermined manner of death* where the decedent died from a *drug overdose*, as determined by reviewing the underlying cause of death assigned by the medical examiner, and the decedent was between the ages of 12-18, were included. The UT-VDRS provided the following additional variables: incident location, toxicology, mental and behavioral circumstances, and precipitating circumstances.

## Suicides

*Suicides* were identified by reconciling the Utah Vital Records data with MESU data. All cases with a *suicide manner of death* were included. The UT-VDRS provided the following variables: incident location, toxicology, mental and behavioral circumstances, and precipitating circumstances. Findings from the CFRC contributed when available. National data came from CDC WONDER (Wide-ranging Online Data for Epidemiologic Research).

## Other Data Sources

### The Utah Violent Death Reporting System (UT-VDRS)

The UT-VDRS is an incident based system that collects detailed information from death certificates, medical examiner records, police reports, crime lab records and supplemental *homicide* reports on all violent deaths in Utah. In this report, the *Homicide*, *Suicide*, and *Poisoning Deaths of Undetermined Manner* sections all contain data from NVDRS.

### Utah Department of Public Safety and Fatality Analysis Reporting System

Crash reports (DI-9 form) provide a uniform collection of variables for *motor vehicle* crashes on roadways and highways. They also sometimes exist for other incidents (e.g., driveway backovers and *ATV* crashes). Utah's DI-9 form is the Model Minimum Utah Crash Criteria (MMUCC) and collects data for national fatal crash reporting (Fatality Analysis Reporting System or FARS).

### Child Fatality Review Committee (CFRC)

The CFRC meets to review cases that a member/s of the committee has questions or concerns about. New information not included in other data sources regarding the death is gathered during the meeting. Meeting notes serve as an additional data source for cases that receive full committee review.

### Age and Sex

Age and sex variables came from Utah Vital Records and MESU data.

## Urban, Rural, and Frontier Residence

To calculate rates for *rural-urban residence*, two sources of data were used: the “county-of-residence variable” on death certificates and the “population density by land area (*frontier, rural, and urban*) and county of residence” table published annually in Utah’s Vital Statistics: Births and Deaths available from the UDOH.

## Race and Ethnicity

To calculate rates for *race* and *ethnicity*, two sources of data were used: the “*race* and/or *ethnicity* variables” on death certificates and the population estimates derived by UDOH Office of Public Health Assessment, available in the 2005 Health Status by Race and Ethnicity report.



# Appendix: Child Death Review Flow Charts

# Child Death Review Flow Charts

